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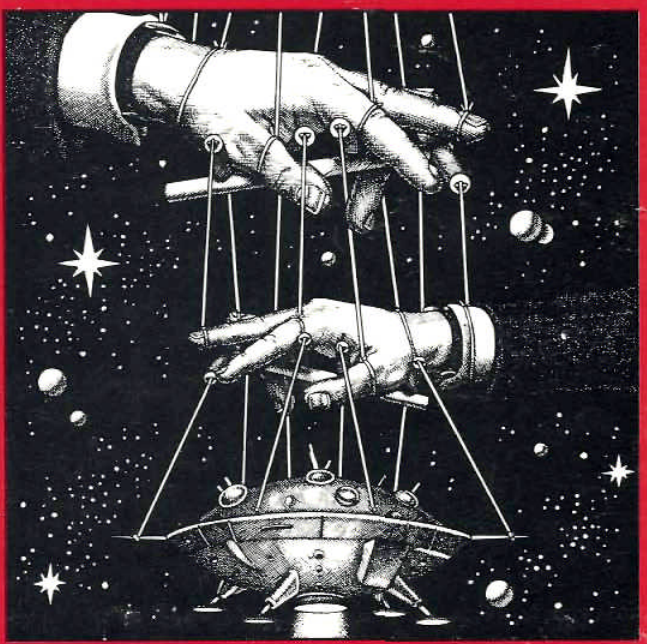
the Skeptical Inquirer

The Condon UFO Study



Four Decades of Fringe Literature
Remote Viewing Unmasked
Flew on Parapsychology
Sebeok on Animal Language
Shneour on Occam's Razor

VOL. X NO. 4 / SUMMER 1986 $5.00
Published by the Committee for the Scientific Investigation of Claims of the Paranormal

the Skeptical Inquirer

THE SKEPTICAL INQUIRER is the official journal of the Committee for the Scientific Investigation of Claims of the Paranormal.

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Subscriptions, change of address, and advertising should be addressed to: THE SKEPTICAL INQUIRER, Box 229, NY 14215-0229. Old address as well as new are necessary for change of subscriber's address, with six weeks advance notice.

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Subscription Rates: Individuals, libraries, and institutions, $20.00 a year; back issues, $5.00 each (vol. 1, no. 1 through vol. 2, no. 2, $7.50 each).

Postmaster: THE SKEPTICAL INQUIRER is published quarterly. Spring, Summer, Fall, and Winter. Printed in the U.S.A. Second-class postage paid at Buffalo, New York, and additional mailing offices. Send changes of address to THE SKEPTICAL INQUIRER, Box 229, Buffalo, NY 14215-0229.

the Skeptical Inquirer

Journal of the Committee for the Scientific Investigation of Claims of the Paranormal
Vol. X, No. 4 ISSN 0194-6730 Summer 1986

TENTH-ANNIVERSARY ESSAYS

310 **Occam's Razor** *by Elie A. Shneour*

314 **Clever Hans Redivivus** *by Thomas A. Sebeok*

319 **Parapsychology, Miracles, and Repeatability** *by Antony Flew*

ARTICLES

328 **The Condon UFO Study: A Trick or a Conspiracy?** *by Philip J. Klass*

342 **Four Decades of Fringe Literature** *by Steven Dutch*

353 **Some Remote-Viewing Recollections** *by Elliot H. Weinberg*

NEWS AND COMMENT

290 Remote Viewing / Paranormal Trends / Bleeding Statue / Technological Literacy / Public Knowledge of Science / Royal Society Speaks Out / Florida Creationists / Handwriting Analysis / Astrology Disclaimer / Pseudoscience in Sweden

NOTES OF A PSI-WATCHER

303 Science, Mysteries, and the Quest for Evidence *by Martin Gardner*

PSYCHIC VIBRATIONS

307 More on the *ri* and the Paluxy River footprints *by Robert Sheaffer*

BOOK REVIEWS

359 Douglas Stalker and Clark Glymour, eds., *Examining Holistic Medicine* (Wallace I. Sampson)

362 Wade Davis, *The Serpent and the Rainbow* (Gordon Stein)

363 **ARTICLES OF NOTE**

FOLLOW-UP

370 An exchange between John Beloff and Martin Gardner on D. D. Home's levitations

FROM OUR READERS

374 Letters from Alistair B. Fraser, Thomas A. Sebeok, David W. Briggs, David Carl Argall, Robert F. Tinney, Lindsey Pherigo, Dave Gerr, Steven J. Johnson, John Bohatila, James Randi, Richard Dreselly, Paul J. Woods, C. Leroy Ellenberger, A. P. Grishin, Paul V. Turner, Mark Beutnagel, John F. Davis, Jefferson P. Swycaffer, and Roger B. Culver

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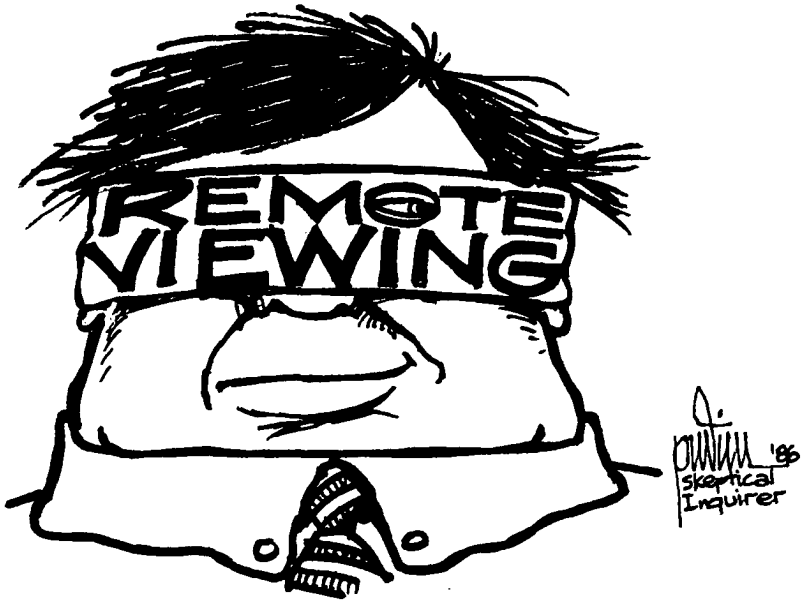

to remember or have access to the target-transcript matchings. At that time Marks noted that he had been unable to obtain a complete set of transcripts from the investigators despite frequent requests. He repeated his request for them in his 1982 *SI* article.

In 1982, Christopher Scott, a London psychologist and statistician and investigator of psi claims, took up the quest. In a letter mailed May 8, a second letter a few days later, and a cable on August 9, 1982, Scott requested to see the original Price transcripts. He repeated his request at the Cambridge joint-meeting of the Parapsychological Association and the Society for Psychical Research on August 17, 1982. Puthoff, who was in the audience, replied, "I think that could be possible," or words to that effect. Still more followup requests were made.

In January 1985, Puthoff mailed the *edited* transcripts. These had not been requested.

Scott persisted in requesting the unedited (original) transcripts. He also gave notification to the Parapsychological Association of Puthoff's failure to send these data.

At last, Marks and Scott reported in the February 6, 1986, *Nature* (319:444), Puthoff has released the relevant data. The brief report presents their analysis of it. What do the much-sought transcripts reveal?

"Having examined both the edited and unedited transcripts," state Marks and Scott, "we note that Tart failed to remove a number of potentially useful cues from the transcripts given to his judge. This bias in Tart's editing, as was suspected earlier, invalidates the judging exercise."

Marks told the SKEPTICAL INQUIRER that Puthoff sent Scott the unedited transcripts on July 30, 1985. (He says he suspects that Puthoff relented because of pressure from the Parapsychological Association.) "Scott and I conducted page comparisons for certain critical parts of the transcripts and quickly discovered many verbal cues were present in both versions of the transcripts." They submitted their findings to *Nature*.

Their report, titled "Remote Viewing Exposed," points out that eight of the

Nature Slams Parascience

THE BRITISH journal *Nature* recently published one of the strongest critical reviews on the subject of paranormal claims to appear in a mainline scientific journal in years.

The six-page cover article in the March 13 *Nature* by psychologist (and CSICOP Fellow) David Marks is separate from his earlier, brief report on remote-viewing (see accompanying article). Its introductory summary pulls no punches: "Parascience has so far failed to produce a single repeatable finding and, until it does, will continue to be viewed as an incoherent collection of belief systems steeped in fantasy, illusion, and error."

The article recounts the failure of paranormal researchers to produce hard evidence for extrasensory perception and precognition. (It gives references to many critical investigations published in the past ten years.) It then considers reasons for the widespread belief in the paranormal despite this. It discusses psychological factors responsible for paranormal beliefs (mental imagery, expectancy, subjective validation, invisible chains of cause and effect that bias probabilities away from chance levels, and the desire to believe).

The article is more than a valuable summary for the skeptic. Since *Nature* is one of the world's most widely read and respected scientific journals, it will reach scientists who normally don't see the literature evaluating paranormal claims.

—*K.F.*

nine allegedly edited transcripts retain information concerning the subject's location. One, for instance, includes a question from Targ asking the subject if he noticed "any difference in being in a shielded room compared to being in the park." This was the first experiment conducted in a shielded room.

Another contains a unique cue of the subject's location, an office used only on that one occasion. All of the transcript from one experiment and portions of the transcripts from three others had been published in Targ and Puthoff's 1977 book *Mind-Reach;* the judge in the rejudging experiments could easily look up the relevant information or recall it from memory. The transcripts of three of the experiments not excerpted in the book contain cues that can be readily matched to the targets. Marks and Scott report that only two of the nine experiments remain potentially uncued in the rejudging exercise.

Their verdict is a strong indictment of remote-viewing claims. "Considering the importance for the remote viewing hypothesis of adequate cue removal," they conclude in their report, "Tart's failure to perform this basic task seems beyond comprehension. As previously concluded, remote viewing has not been demonstrated in the experiments conducted by Puthoff and Targ, only the repeated failure of the investigators to remove sensory cues."

This revelation should virtually end any further claim to scientific status of the remote-viewing experiments. And it raises still further questions. Says Marks, "On the one hand Puthoff has made the data available (a plus) but, on the other, the data are so flawed that the Tart rejudging can be seen to be worthless and incompetently done (a minus). One is also left wondering how Tart could have left so many cues in the transcripts unwittingly. This is the same question one had in discovering the cues in the first unedited transcripts."

—*Kendrick Frazier*

The Paranormal in Print: Tracking Trends in the Media

ALMOST SINCE its inception, the Education Subcommittee of CSICOP has conducted a "daisy-chain" routing by mail of paranormal and related claims and responses appearing in popular print media. This has been done in an attempt to keep abreast of popular trends in the pseudosciences as reflected by coverage in newspapers, magazines, and so on.

In 1985 alone, subcommittee members clipped 207 articles, book reviews, ads, and the like, and sent them off to one of our co-chairs (John Cole and Jim Alcock), who in turn sent them through the chain. The focus was and continues to be on mainstream sources; supermarket tabloids are generally not included, nor are professional journals, though the variety of materials has been enormous.

We can make no claim that the sample of 207 is entirely representative of popular coverage of paranormal and related claims for 1985. It is nevertheless instructive to present some of the apparent trends, as they provide a relative impression of such coverage for the past year.

Newspaper articles accounted for the greatest proportion of items (42 percent). Magazine and newsletter pieces followed (21 percent), with pamphlets (10 percent); a small number of book reviews, advertisements, and published letters filling out the sample.

The geographic mix of articles probably reflects the vagaries of subcommittee membership and individual levels of participation rather than regional differences in paranormal coverage: 32 percent of the material was derived from Northeast publications, 9 percent from the Midwest, 9 percent from the West, 6 percent from the Southeast, and 1 percent from the Southwest. Thirteen percent of the material was from international sources, primarily England and Australia. Twenty-nine percent was derived from publications with national circulations.

I coded daisy-chain material by topic and then tallied the percentages of these topics in an attempt to produce a barometer of public coverage of the paranormal and related claims for 1985. (See Table 1.) My topic typology included

TABLE 1

Topic	Daisy-chain Articles %
ESP	12
UFOs	3
Ancient astronauts	1
Creationism	22
Ghosts	2
Dowsing	5
Perpetual motion	1
Shroud of Turin	1
Crank medicine	2
Astrology	2
General religion	11
Crank archaeology	6
General science response	5
Life after death	2
Other	26

N = 207

most of the well-known and presumably popular forms of pseudoscience, a category for general scientific response, and a catchall category for various paranormal/pseudoscience esoterica, including cult murders, dinosaur cloning, the Mars face, firewalking, and so on.

While we should not make too much of the figures in Table 1, they almost surely reflect the current popularity of certain of the pseudosciences and the unpopularity of others—at least as this relates to print-media coverage. The abundance of pieces on creationism, general religion (including exorcism, proofs of God's existence, etc.), and ESP is probably an accurate reflection of the relative intensity of general print-media coverage and, by inference, the level of controversy and popular reader interest. On the other hand, the low figures for ancient astronauts, perpetual motion, and the Shroud of Turin probably reflect nadirs in coverage and, by inference, lows in popular interest in these topics (at least in terms of those areas covered by daisy-chain members—local "flaps" may contradict these overall trends).

I also coded the pieces on the basis of the approach or perspective employed (1 = skeptical, 2 = credulous, 3 = neutral, 4 = other/does not apply). Overall, 28 percent of the items could be characterized as skeptical in approach, 40 percent as basically credulous, and 27 percent as neutral or even-handed. For the

TABLE 2

Topic	Skeptical %	Credulous %	Neutral %	Other %
ESP	16	48	36	-
*UFOs	29	29	43	-
*Ancient astronauts	-	100	-	-
Creationism	40	38	20	20
*Ghosts	25	50	25	-
Dowsing	40	50	10	-
*Perpetual motion	-	-	100	-
*Shroud of Turin	-	33	66	-
Crank medicine	-	100	-	-
*Astrology	50	25	25	-
General religion	22	35	43	-
Crank archaeology	17	42	42	-
General science response	50	-	20	30
Life after death	-	80	20	-
Other	28	40	21	11
All topics inclusive	28	40	27	

*Fewer than ten articles.

remaining 5 percent, none of these characterizations could be applied.

Breakdown by topic, approach, or perspective is expressed in Table 2. Again, while no claim can be made for a representative sample, where the subsets are large enough these data are in all likelihood a reasonable reflection of differences in popular media approaches to these topics. There seems to be a relatively high level of credulity (when compared with the already high overall credulity level of 40 percent) regarding general ESP topics. On the other hand there seems to be a relatively high level of skepticism regarding creationism and dowsing, and a greater than overall level of neutral coverage accorded to ESP, general religious claims, and crank archaeology. It should be pointed out, however, that the figures for articles related to creationism are certainly skewed, since many of the more skeptical pieces that passed through the chain appeared in publications aimed at a general audience of scientists and educators. Thus, if we focus on newspapers alone, the figures are quite different for creationism, with skepticism and credulity levels both at 22 percent, while 54 percent of the articles took a neutral position.

I am continuing to tally daisy-chain material for 1986. It will be interesting indeed to chart out any possible differences in what is "hot" and what isn't in paranormal coverage and to assess improvement or, at least, changes in popular media attention to the paranormal and the pseudosciences. If you have any suggestions regarding this endeavor and, especially, if there are any print-media pieces that you would like to see sent through the chain, please contact me or either of the subcommittee chairs.

—*Ken Feder*

Ken Feder is in the Department of Anthropology, Central Connecticut State University, New Britain, CT 06050.

The Hoax of the Bleeding Statue

A BLEEDING STATUE of the Virgin Mary of the Mystic Rose, in rural Quebec, recently attracted considerable attention in the press and on television in both Canada and the United States. The statue, apparently one of 20 locally made copies of an original by Padre Pio of Petrelcina, was reported variously as weeping tears of blood or sweating blood. Photographs showed the face of the Virgin, even her forehead, covered with large dark splotches. Pilgrims by the hundreds visited the statue,

"Bleeding" statue

located in the home of Claudette and Maurice Girouard in Ste.-Marthe-sur-le-lac, in the Laurentian Mountains near Montreal. Mr. Girouard had purchased the Virgin in early December, and it started to weep the day after the Feast of the Immaculate Conception. After January 1, its tears became bloody.

The local bishop expressed grave doubts about the authenticity and spiritual significance of the statue. On the other hand, Professor Louis Belanger, a psychologist at the Faculty of Theology of the University of Montreal, urged people to approach the phenomenon with open minds, "as if it were true," according to the *Journal de Montreal*, and added that it was possible that it might be a paranormal event or one caused by God or Satan.

Once reporters started to investigate, interesting facts were discovered. First, a

member of a TV crew succeeded in scraping a few tears from the Virgin's face and had them analyzed. They turned out to be composed of 70 percent pork drippings; the remainder, beef fat and vegetable oil. Then it was reported that Girouard, the statue's owner, had twice been convicted of practicing medicine without a license, calling himself a "hypnologist and sophrologist," and falsely claiming to have earned various impressive university degrees. Finally, on January 17, a Mr. Jean-Guy Beauregard admitted that he had regularly applied the oil, along with some of his own blood, to the statue, claiming that Mr. Girouard had forced him to do it by hypnotism.

—*Robert S. Carswell*

R. S. Carswell is an attorney in Montreal.

Editor's postscript: This affair was notable in that the hoax was quickly discovered and reported. The Associated Press distributed the hoax-revelation story nationally in the United States, where it was published widely in newspapers of January 18 and 19, 1986. Sample headlines: "Bleeding Virgin Mary Exposed as Hoax," "Quebec's 'Miracle' Melts Away," and "Bleeding Virgin Mary Depends on Gullible for a Miracle."

Technological Literacy in U.S.: Poll Shows It's Unsatisfactory

A NEW POLL of the "technological literacy" of adults in the United States has produced, perhaps predictably, some troubling results. The national survey of 2,000 adults was conducted by telephone by the Public Opinion Laboratory of Northern Illinois University. Results of the survey, supported by the National Science Foundation, were reported recently at a conference on technological literacy by Jon D. Miller, director of the laboratory. The data also appear in *Science Indicators—1985*, a biennial report of the National Science Board, NSF's governing body.

Technological literacy is conceptually distinct from scientific literacy. A 1983 analysis by Miller, using some 1979 data, indicated that only 7 percent of adults in the United States qualified as scientifically literate (Miller, *Daedalus*, 112(2):29-48).

The 1985 study of technological literacy first asked participants whether they had a clear understanding of, a general sense of, or little understanding of four terms judged important to technological literacy: radiation, computer software, GNP, and how a telephone works. The results indicated that 31 percent of the American people think they have a clear understanding of radiation; 27 percent, of the gross national product; 24 percent, of computer software; and only 19 percent, of the telephone. (See Table 1.)

The respondents were also asked to indicate whether they strongly agreed, agreed, disagreed, or strongly disagreed with each of a series of statements chosen to assess technological literacy. Miller said it is important for the technologically literate citizen to understand that technology is a rational effort to apply scientific knowledge and that one should not place great reliance on luck or avoid planning.

The results indicated that 78 percent rejected the idea that "it is not wise to plan ahead because many things turn out to be a matter of good or bad luck anyway," while 56 percent disagreed with the statement that "some lucky numbers are especially lucky for some people." (See Table 2.)

"While it is somewhat comforting to find that a majority of the American people reject luck as the driving force of their lives and of society," says Miller, "it is important to remember that each percentage point in a national survey represents 1.7 million people. In real

TABLE 1: Public Understanding of Selected Technical Terms

	Level of Understanding		
	Clear	General	Little
Radiation	31%	51%	19%
GNP	27	22	50
Computer software	24	33	43
How a telephone works	19	48	33

N = 1,992

TABLE 2: Public Acceptance of Selected Technological Ideas

	Agree	Not Sure	Disagree
It is not wise to plan ahead because many things turn out to be a matter of good or bad luck anyway.	20%	2%	78%
Some numbers are especially lucky for some people.	40	4	56
Smoking causes serious health problems.	95	1	3
There are good ways of treating sickness that medical science does not recognize.	75	8	18
Rocket launchings and other space activities have caused changes in our weather.	41	12	47
It is likely that some of the unidentified flying objects that have been reported are really space vehicles from other civilizations.	43	11	46

N = 1,992

numbers, these results indicate that approximately 37 million Americans eschew planning for the future and that almost 75 million believe in lucky numbers."

Two statements included helped assess "the ability to distinguish between likely scientific or technical results and fictional or hearsay accounts." One was "Rocket launchings and other space activities have caused changes in our weather"; the other was "It is likely that some of the unidentified flying objects that have been reported are really space vehicles from other civilizations." "In both cases," says Miller, "slightly fewer than half of American adults were willing to disagree with the statement. These responses suggest a substantial level of confusion between real or likely technologies and fictional technologies."

Miller finds the overall level of performance not satisfactory. "Public policy agendas . . . are full of issues and problems that require some level of technological literacy to support minimal discourse. . . . Given our commitment to democratic government, these data argue for the urgency of the task of increasing and improving technological literacy in the United States."

—*K.F.*

News and Comment

The Case of Remote Viewing: Transcripts, Finally Released, Are Filled with Cues

THE REMOTE-VIEWING claims of physicists Russell Targ and Harold Puthoff have been challenged on many counts. One was that access to their original data had never been granted to outside investigators despite repeated requests and several public statements that they would be forthcoming. Since these claims are often treated as among the strongest evidence for psi abilities, critics felt they merited the closest possible scrutiny by the scientific community.

In remote-viewing experiments, a laboratory subject mentally tries to "view" a scene being visited by another person and records his impressions. Judges later visit the scene and, making use of the transcripts, try to match them against a series of targets and rank how close the subject came. Targ and Puthoff have claimed dramatic results in such experiments.

One request for their original data had come from David Marks, a University of Otago (New Zealand) psychologist and co-author of *The Psychology of the Psychic.* Marks and the late Richard Kammann had published a report in the British scientific journal *Nature* in 1978 (274:680-681) challenging Targ and Puthoff's experiments on remote viewing on the grounds that sensory cues were available to the judges, enabling correct matching of the subjects' descriptions against the target locations.

(See Marks, "Remote Viewing Revisited," *SI,* Summer 1982, reprinted in Frazier, ed., *Science Confronts the Paranormal,* Prometheus, 1986, for a full status report. See also Ray Hyman, "The Muddled 'Mind Race': Outracing the Evidence," *SI,* Winter 1984-85, for an evaluation of Targ and Keith Harary's recent book, and Martin Gardner, *Science: Good, Bad, and Bogus,* for related critiques.)

In 1980 parapsychologist Charles Tart, countering Marks and Kammann's objections, organized a rejudging of a series of remote-viewing experiments by subject Pat Price that yielded results as significant as those Targ and Puthoff originally obtained (*Nature,* 284:191, 1980). Marks (*Nature,* 292:177, 1981) disputed the validity of this rejudging exercise on two counts—that the editing of transcripts was carried out by one of the investigators (Tart) and that some of the rejudged material had already been published, enabling a judge theoretically

Americans Respect Science, Don't Know Much About It

THE NATIONAL Science Board's biennial report concludes that, while almost half of the American public report a high level of interest in science and technology and great confidence in scientists, they don't know very much about these areas. The 314-page report, *Science Indicators—1985,* was issued in January.

In 1983, 48 percent of adults surveyed said they were very interested in issues concerning new scientific discoveries, and 44 percent were very interested in issues involving the use of new inventions and technologies.

"In contrast to [public] interest," the report says, ". . . only 14 percent of the public classified themselves as well informed about science and technology issues."

Of 12 major American institutions, only the medical community received a higher level of confidence than the scientific community.

—*K.F.*

The Royal Society Speaks Out Against Pseudoscience

THE ROYAL SOCIETY, Britain's premier scientific body, has issued a report calling for bolstered efforts to increase the public's understanding of science. Among the many reasons given was to help resist pseudoscience: "Greater familiarity with the nature and the findings of science will also help the individual to resist pseudo-scientific information. An uninformed public is very vulnerable to misleading ideas on, for example, diet or alternative medicine. An enhanced ability to sift the plausible from the implausible should be one of the benefits from better public understanding of science."

—*K.F.*

Creationists Lose in Florida

FLORIDA GOVERNOR Bob Graham and his cabinet voted in March against including creationist teachings in biology texts for public secondary-school students. The action came after hours of sectarian debate, marked by vociferous objections to the books by opponents of the teaching of evolution. Some booed when one speaker defended evolution. They objected to 22 biology texts recommended for purchase by Florida's 67 school districts. The governor and his cabinet sit as the State Board of Education. Despite the objections, they approved the 22 books by a 5-0 vote. Donna Stull, the chairwoman of a committee that recommended the biology texts to the board, called the approval a vote for reason. "Creationism is a belief not based on scientific evidence. If you're going to include beliefs, let's include witchcraft, UFOs, ESP. There are a lot of beliefs."

—*K.F.*

Handwriting Analysis: Is It All in the Wrist?

MANY STRONG claims are currently being made that handwriting analysis can give clues to character and talent, and reports continue to surface of the growing use of graphology in employment examinations and other testing programs. How valid is graphology? That is undoubtedly a complex question, but specific claims can sometimes be evaluated on their own merits. An example of this is the following criticism sent by *SI* reader Thomas A. Crispin to the *Gifted Children's Monthly,* which had published an article by a "certified" graphologist claiming that gifted children can be identified through graphology.

Specifically, the graphologist reported results of a study in which she examined

writing samples of 82 semifinalists in a competition for placement in a school's program for gifted children. She compared her top 31 picks with the 31 selected by the school and claimed highly favorable results in both that and an independent followup study of the same samples by a team of graphoanalysts.

I came across the "special report" published [in *Gifted Children's Monthly*] in November 1985: "Handwriting May Show Hidden Talent." Frankly, I am appalled that your editors did not catch the statistical errors in the article.

Author Carol Kizorek states that 13 of her 31 picks were accurate, that is, finalists for the gifted program, and that "chance" should have been 10. She claims these results were especially good. Where is her evidence that this result is statistically significant (i.e., that there is only a 5% probability that it could have occurred "by chance")? Furthermore, the correct "chance" result is 12, not 10.

This situation is the same as having a bag of 82 marbles, 31 of which are white. We randomly select 31. How many can we expect to be white? If the selection process is random, we can expect the ratio of white balls to the total number of balls to be the same in our sample as in the entire bag, so the expected number of white balls X is given by the equation:

$$31/82 = X/31.$$

Solving for X gives 11.7.

Ms. Kizorek then goes on to state that a similar test, by another analyst, was so successful that together they correctly identified 20 finalists. That is equivalent to asking how many different white balls can we expect to select in two separate trials. That expectation is almost exactly 19. So what's so great about her result of 20?

I can assume that the numbers are not misprints—why would you print an article showing chance results for handwriting analysis?—so the charitable explanation is that Ms. Kizorek is statistically incompetent, and her evaluation of handwriting analysis is worthless.

Please, in future issues, check similar articles for mathematical accuracy. You do your readers a great disservice in presenting them as "scientific"; readers may come to believe in pseudoscientific nonsense, and they are given a false impression of scientific methods.

Thomas A. Crispin
Klamath Falls, Ore.

Update: Newspaper Astrology Disclaimer

SEVERAL U.S. newspapers now publish a disclaimer with their astrology columns stating that these columns have no basis in scientific fact and that they should be read for entertainment only.

CSICOP, in late 1984, wrote to the editor of every newspaper in the United States asking for the disclaimer (*SI*, Spring 1985) because a Gallup poll had shown that belief in astrology among young people grew from 40 percent in 1978 to 55 percent in 1984 (*SI*, Winter 1984-85).

Among those newspapers now carrying a disclaimer are the *Indianapolis Star*, the *Pittsburgh Post-Gazette*, the *Wil-*

mington News Journal, the *Mattoon Journal Gazette,* the *Charleston Times-Courier,* and the *Austin American-Statesman.*

Prompted by the actions of CSICOP, efforts have begun in Australia and England to get newspapers there to carry the statement.

CSICOP plans to continue to seek the support of newspaper editors for the disclaimer. CSICOP's suggested disclaimer reads:

> The following astrological forecasts should be read for entertainment value only. Such predictions have no reliable basis in scientific fact. •

Pseudoscience Scene in Sweden

THE SUMMER 1983 SKEPTICAL INQUIRER reported the formation of a Swedish CSICOP group, Vetenskap och folkbildning. Since then, the group has received much public attention. We have been interviewed by many newspapers and magazines and on national TV. In 1985, the biggest Swedish morning daily, *Dagens Nyheter,* published a series of feature articles about us and about critical studies of pseudoscience.

In general, Swedish media seem to be more responsible than many in the United States. In some cases, they have invited us to comment on paranormal claims. In other cases, they have published our criticisms of unbalanced articles in their letters columns.

In 1983 and 1984, astrology was very popular in Swedish media. Major newspapers published articles taking the truth of astrological claims for granted. In 1985, however, the situation seemed to improve. Perhaps articles by our group and by members of the astronomical community have contributed to the change.

The latest study of belief in the supernatural in Sweden was published in 1978 by SIFO, a public-opinion institute. Fifteen percent of the public believed "it is possible to see the future in the stars"; 9 percent believed in reincarnation; 14 percent believed that the deceased can come back and be seen by living persons; and 39 percent believed that "there are people who can see the future." These figures are probably higher now as a result of the increased interest in mysticism in the early 1980s.

In Stockholm, our group, in cooperation with the ABV (Arbetarnas Bildningsförbund), the educational organization of the Swedish labor movement, arranged a series of public lectures on different pseudoscientific claims. They have been successful in terms of both attendance and interesting discussions.

In 1985, a new book classification system was proposed for Swedish libraries. The proposal contained several changes for the worse. Books on astrology, for example, were to be moved from the "games and pastimes" shelves to the psychology section. Our criticisms led to several revisions, and the final version now adopted is better than either the original proposal or the previous system. Astrology, UFOlogy, ancient astronauts, cryptozoology, and the like, have been brought together in a new section for anomalous phenomena.

The association of Swedish libraries is now producing a bibliographical fact-sheet, "Alternatives to the Pseudosciences," which will be distributed free of charge in the libraries.

We have also taken part in public debates on cancer-cure quackery, psi, near-death experiences, dowsing, astrology, UFOlogy, racist pseudoscience, creationism, and various sects. Creationism is still weak in Sweden, due to the responsible attitude of most church leaders. Several other pseudoscientific and authoritarian sects, however, have strong organizations here. Among these are Scientology, Transcendental Meditation, and Anthroposophy. We cooperate

with a committee that was formed by concerned families of followers of Scientology.

As chairperson of our group and author of a book on pseudoscience, I have lectured in all parts of Sweden. Teachers often ask for lectures in their schools. One of the most positive experiences has been to meet schoolchildren as young as 12 and 13 who are full of questions on UFOs, ghosts, thought-reading, and so on, and have not closed their minds to rational explanations.

Our executive board consists of: Berndt Brehmer, Lena Carlsson (vice chairperson and editor of our bulletin, *Folkvett*), Gunnar Englund (vice-secretary) Sten Ewerth, Sven Ove Hansson (chairperson), Svante Janson (secretary), Martin Koff, Gunnar Steineck, and Jonas Söderström (treasurer).

Norway also has a CSICOP group. Our organization includes members from Denmark and Finland; there is no national group in Denmark, Finland, or Iceland. We are particularly interested in contacts with skeptics in these countries. Perhaps groups could be formed there.

We are also interested in contacts with other skeptic organizations. Our mailing address is Vetenskap och folkbildning, Box 185, 101 22 Stockholm 1, Sweden.

—*Sven Ove Hansson*

Opportunity to Teach Real Science

The appeal of the paranormal provides a wonderful opportunity to teach real science. The natural fascination people have with the paranormal and with astrology, UFOs, and the like can be converted into a curious audience willing to hear about the science involved. Astronomers and physicists can use questions about astrology to pull students into discussions of the cultural basis of constellations, the problem of precession, the scale of the solar system and the universe, the principles of gravitation and electromagnetism, and virtually any other topic in astronomy and physics. They can do the same thing with UFOs. Psychologists can use case studies about psychic claims to make any number of points about human perception, the limitations of observation, the flexibility of the mind, and so on. The interest in fringe medicine can be used as a springboard to discussions of the mind/body problem, the placebo effect, and human physiology. Questions raised about creationism can lead into the most central topics of biology, geology, and astronomy.

Carl Sagan has said that the wonders of real science far surpass the supposed and imagined mysteries of fringe science, and I agree. Scientists have an opportunity to show that science deals with awesome mysteries and concepts, from the mind-boggling information content of human DNA to the physics of the first 10^{-30} second of the existence of the universe. It's a fascinating world, and science is always on the frontier looking out into the unknown. People want to share in that adventure and experience. And they will, with just a bit of encouragement and guidance. Then they are with you, learning and exploring together, in a partnership of science.

—Kendrick Frazier. From the Introduction to *Science Confronts the Paranormal* (Prometheus Books, 1986)

CSICOP Tenth Anniversary Fund
B. F. Skinner, Honorary Chairman

B. F. Skinner has agreed to serve as Honorary Chairman of the CSICOP Tenth Anniversary Fund. Dr. Skinner notes that he is extremely busy with research and writing and seldom takes on additional projects, but he feels the work of CSICOP is so important and unique that he is breaking his general rule.

Similarly, there are many calls upon each of us for our time and financial resources, but CSICOP is at a crossroads and really needs a major infusion of support to ensure its long-term viability. The Committee is small, but its influence has been impressive. One of the major reasons for this is the catalysis of enthusiastic support by *SI* readers who take initiatives ranging from lobbying local schoolboards to founding regional organizations and new publications.

CSICOP and the SKEPTICAL INQUIRER are ten years old this year. Thanks to your subscriptions and contributions from supporters, we provide a much-needed skeptical voice in the midst of a cacophony of sensationalized and credulous reports of old and new paranormal claims. We sponsor conferences, have greatly expanded our outreach to the news media, increased our support for the investigation of paranormal claims, and are fielding an increasing flow of inquiries from the media and the general public. The SKEPTICAL INQUIRER is the *only* magazine of its kind; we think it does an essential job.

We plan to develop a definitive library/archive/database on paranormal claims, to establish liaisons with other organizations, to expand our program of providing speakers to public meetings and interviewees for the mass media, and to produce audiovisual resources for use in schools. We must upgrade our information resources and our ability to disseminate this information if we are to achieve CSICOP's potential for constructive influence on public thought and scientific research.

We will be very grateful for your tax-deductible contribution, large or small. The Tenth Anniversary Fund will guarantee our future.

Paul Kurtz, *Chairman*

Executive Council: James Alcock, Kendrick Frazier, Martin Gardner, Ray Hyman, Philip J. Klass, Lee Nisbet, James Randi

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MARTIN GARDNER

Notes of a Psi-Watcher

Science, Mysteries, and the Quest for Evidence

> A man is a small thing, and the night is very large and full of wonders.
>
> Lord Dunsany,
> *The Laughter of the Gods*

PARAPSYCHOLOGISTS AND psi journalists are fond of an argument that goes like this: Orthodox science is making such colossal strides, putting forth such bizarre theories, that no one should hesitate to accept the reality of psi. It is a theme that pervades Arthur Koestler's influential *Roots of Coincidence*. As parapsychology becomes "more rigorous, more statistical," Koestler writes on the very first page, theoretical physics becomes

> more and more "occult," cheerfully breaking practically every previously sacrosanct "law of nature." Thus to some extent the accusation could even be reversed: parapsychology has laid itself open to the charge of scientific pedantry, quantum physics to the charge of leaning towards such "supernatural" concepts as negative mass and time flowing backwards.
>
> One might call this a negative sort of rapprochement—negative in the sense that the unthinkable phenomena of ESP appear somewhat less preposterous in the light of the unthinkable propositions of physics.

It is true that modern science is making discoveries and formulating theories that contradict experience and boggle the mind, but this has always been the case. I suspect that most people are less boggled today by the wonders of science than they were boggled in the past by the notion that the earth rotates and goes around the sun. Indeed, all the evidence of the senses suggests that the earth is immovable and the heavens rotate. The centuries that elapsed before the Copernican theory became entrenched in the common beliefs of the civilized world—including the beliefs of Catholics and Protestants, who fought the theory as long as they could—testify to the cultural shock of such a monumental paradigm shift, to use Thomas Kuhn's fashionable phrase.

Today the public is much less bewildered by the paradoxes of relativity and QM (quantum mechanics), not just because it has grown accustomed to the surprises of science but because the paradoxes are too technical to understand. If a twin takes a long space trip at fast speeds and returns to earth, he will be younger than his stay-at-home twin. If he goes far enough and fast enough, he could return to find that centuries on earth had gone by. Most nonphysicists, unless they read science fiction, have

never heard of the paradox.

The same can be said of recent confirmations of the notorious EPR paradox that Einstein and two friends (E, P, and R are the initials of the three last names) devised to show that QM is incomplete. Two particles, separated by vast distances, can under certain circumstances remain "correlated" in the sense that, if one particle is measured for a property, the other is altered even though there is no known causal connection between the pair. Who is troubled by what Einstein called the "telepathy" of his paradox except physicists and philosophers of science?

The big bang, black holes, and other awesome aspects of modern cosmology have been dramatic enough to reach the general public, but I see no evidence that the public is disturbed. If *Time* reports that some physicists now think all particles are made of inconceivably tiny "superstrings," vibrating in spaces of ten dimensions, it is not likely to be a topic of cocktail-party chatter except in science circles. The only establishment claim now arousing strong public emotion is evolution, and that is because of the astonishing revival of Protestant fundamentalism.

From the beginning, science has been upsetting and drastically modifying history. It does not, however (as Koestler writes), progress by breaking sacrosanct laws. No laws of science are sacrosanct, and "breaking" is a poor word for the meandering process by which laws are refined. Great paradigm-shifts build on what went before. Ancient astronomers were good at predicting the motions of planets long before astronomy accepted a central sun. Let $1/c$, where c is the speed of light, reduce to 0 in the formulas of relativity, and you have Newton's formulas. Let Planck's constant equal 0, and QM becomes classical mechanics. The great revolutions of science are better described as benign evolutions. They refine what was known before by placing that knowledge within new theoretical

frames that have superior power to explain and predict.

There are other reasons that the progress of science is cumulative and increasingly rapid. Every decade the number of working scientists increases. In Galileo's day you could count the number of physicists on your fingers. Today tens of thousands of journals report the latest scientific discoveries and conjectures, many of the conjectures (as Koestler rightly perceived) more outlandish than the claims of parapsychology. Instruments of observation get better and better. Galileo's telescope was a child's toy. Microscopes using particles other than photons have greatly increased the range of observation of the small. Giant particle accelerators provide empirical underpinnings for strange new theories of matter that could not possibly have been devised even in Einstein's day. Space probes have disclosed more facts about the planets in the past 20 years than in the previous 200.

Koestler is right in one sense. The results of science should instill in all of us a strong awareness of how mysterious and complex nature is. In the words of J. B. S. Haldane, which occult journalists love to quote, the universe is queerer than we can suppose. Every scientist and every layperson should be open to any scientific

claim no matter how preposterous it may seem. If it turns out that the human mind can view a remote scene by clairvoyance, or influence a falling die or a random-number generator, this surely would be no more surprising than thousands of well-confirmed natural phenomena.

Does it follow from such admirable open-mindedness, from what the American philosopher Charles Peirce called the "fallibilism of science," that we should all accept the ability of psychics to bend paperclips with their psi powers? It no more follows than it follows from modern cosmology that (as Velikovsky maintained) the moon's craters are only a few thousand years old, or (as Jerry Falwell firmly believes) that the earth was created in six literal days and dinosaurs were beasts that perished in Noah's flood.

We can now say what is wrong with Koestler's rhetoric. The extraordinary claims of modern science rest on extraordinary evidence. No physicist today would be bothered in the least by the seemingly paranormal aspect of the EPR paradox if it did not follow inescapably from firmly established laws of QM, and from carefully controlled laboratory tests. But the extraordinary claims of parapsychology are *not* backed by extraordinary evidence.

For reasons that spiritualists have never been able to explain, the great mediums of the nineteenth century could perform their greatest miracles only in darkness. The equivalent of that darkness today is the darkness of statistics, and why psi phenomena flourish best in such darkness is equally hard to comprehend. If a mind can alter the statistical outcome of many tosses of heavy dice, why is it powerless to rotate a tiny arrow, magnetically suspended in a vacuum to eliminate friction? (J. B. Rhine's laboratory, by the way, made many unsuccessful experiments of just this sort, but they were never reported.) The failure of such direct, unequivocal tests is in my opinion one of the great scandals of parapsychology.

Why is it that the most respectable evidence today for PK, the work of Helmut Schmidt and Robert Jahn, involves sophisticated statistical analyses of thousands of repeated events? The skeptic's answer is that, when a supposed PK effect is so weak that it can be detected only by statistics, many familiar sources of bias creep into the laboratory. In the case of S. G. Soal, once hailed as England's top parapsychologist, we now know that the bias was outright fraud. Even when researchers are totally honest, it is as difficult to control the effect of passionate desires on methods of getting and analyzing data as it is to keep sealed flasks free of bacterial contamination.

No skeptic known to me rules psi forces outside the bounds of the possible. They are merely waiting for evidence strong enough to justify such extraordinary claims. Their skepticism is not mollified when they find the raw data of sensational experiments sealed off from inspection by outsiders or when failures of replication by unbelievers are blamed on unconscious negative vibes.

I am convinced that today's skeptics would have not the slightest difficulty—I certainly would not—accepting ESP and PK the instant evidence accumulates that can be reliably replicated. Unfortunately, for 50 years parapsychology has rolled along the same murky road of statistical tests that can be repeated with positive results only by true believers. Psi forces have a curious habit of fading away when controls are tightened or when the experimenter is a skeptic—sometimes even when a skeptic is just there to observe.

Surely every parapsychologist worthy of respect now knows (even though he won't say so) that psychics are unable to bend spoons, move compass arrows, or produce thought photographs if a magician is watching. As for the more responsible and more modest claims that rest on statistics, they are too often obtained solo or by a small band of

researchers who will not let an outsider monitor what is going on. Raw data is often kept, as most of it is at SRI International, permanently under wraps.

Parapsychologists are forever accusing establishment psychologists of wearing blindfolds that make it impossible for them to see the results of the new Copernican revolution. If the results are as claimed, it is indeed a paradigm shift more sensational than most of the great shifts of the past, and Rhine deserves to rank with Copernicus, Newton, Einstein, and Bohr. Alas, the claims remain as poorly verified as nineteenth-century claims that character traits correlate with bumps on the head.

It would be good for every parapsychologist to study the history of phrenology. At one time, the number of scholarly journals devoted to this "science" far exceeded the number of journals that are today devoted to parapsychology; and, at one time, the number of distinguished scientists who believed that phrenology had been strongly confirmed far exceeded the number of distinguished psychologists today who believe that parapsychology has established the reality of the phenomena it studies. •

Pseudoscience, Scientists, and the Public

Pseudoscience has a long history and has appeared in many guises. Yet only comparatively recently have scientific institutions such as associations for the advancement of science come to take its existence seriously. This has occurred because there are many pseudoscientific doctrines which seek public legitimation and support by claiming to be scientific; others purport to offer alternative accounts to those of science or claim to explain what science cannot explain. Both types are thought to pose a potential threat to the public understanding of science. Many laymen have difficulty in distinguishing science from impostures because they have only a very vague idea of what science is about. There has been a growing tendency among members of the educated public and especially among intellectuals, including even some scientists, to challenge the right of scientific opinion to a deciding voice in what is to be regarded as science and what as pseudoscience. This challenge is directed against the "elitist dogmatism" of science, and is part and parcel of a broader contemporary movement to denigrate science. It is claimed that scientists have no rational grounds for distinguishing science from pseudoscience and do so solely to retain their present monopoly over the investigation of nature. Many scientists believe that the popularization of pseudoscientific ideas through print, film, television and radio helps to confuse the public about the true nature of science, fosters uncritical acceptance of false notions generally, and, in some instances, may play on superstitions and irrational fears.

—J. W. Grove, "Rationality at Risk: Science against Pseudoscience," *Minerva,* 23 (2), Summer 1985.

ROBERT SHEAFFER

Psychic Vibrations

THE INTERNATIONAL Society of Cryptozoology (ISC) has finally acknowledged what many of us have long suspected—that mermaids do not grace the remote shores of the islands of Papua New Guinea.

Great excitement was generated in the world of cryptozoology in 1982 when the ISC published a paper by anthropologist Roy Wagner, of the University of Virginia, citing several purportedly credible eyewitness accounts of what natives call the *ri*. Wagner described the creature as reputedly "an air-breathing mammal, with the trunk, genitalia, arms, and head of a human being, and a legless lower trunk terminating in a pair of lateral fins, or flippers." While Wagner admitted certain obvious difficulties with taking such reports literally, he concluded, "I don't think the credibility of some of my informants can be lightly dismissed." (Skeptics chuckled, recalling how nearly identical statements had been used over the years to try to prove the existence of dozens of dubious things, from UFOs and Bigfoot to Arthur Conan Doyle's fairies.)

The ISC quickly mounted an expedition, and in June 1983 several leading cryptozoologists went off to Papua New Guinea in search of the *ri*. (They get very upset if anyone says that they went off looking for mermaids.) They did see something that was supposed to be a *ri* some distance off, but like all fabled creatures it succeeded in evading unambiguous detection.

When the explorers returned, they believed they were really on the trail of something. "Having considered all possibilities," they wrote, "the authors have not been able to identify the Ri or Ilkai as part of the known inventory of zoology. None of the marine mammologists consulted so far are convinced that the animal we observed and photographed is one they are acquainted with. We are left with the tantalizing possibility that the animal we observed is indeed new to science. Whether or not it corresponds to the descriptions given by the Barok and Susurunga natives (*i.e., a mermaid*) remains to be seen. But so far, they are the only people who *do* claim to know the animal." When an account of the expedition was published in these pages, questioning the wisdom of a scientific team traveling halfway around the world to check out the mermaid legends of primitive tribes, I was charged, in surprisingly many quarters, with being far too closed-minded in such matters.

Now the ISC has proclaimed, on rather slender evidence, that all of the *ri* that were purportedly sighted were only dugongs (marine mammals looking somewhat like large seals). As explained in the Spring 1985 *ISC Newsletter*, another expedition to Papua New

Guinea, sponsored by the Ecospherical Research Association of California, saw an animal like that described by Wagner et al. The natives proclaimed it to be an *ilkai.* A diver succeeded in getting close and took clear photographs of it: unmistakably a dugong. Case closed, says the ISC.

One wonders how many cryptozoological marvels the ISC is prepared to jettison upon the collapse of a single erroneous claimed sighting. To be consistent, they must give the many as yet unsolved reports of mermaid sightings the same credibility they give sightings of hominids in the forests and dinosaurs in the jungles: As immortal legendary creatures, they are safely beyond all danger of possible disproof.

* * * * *

While we're on the subject of cryptozoology, we mustn't ignore the brief article titled "Rock-Entombed Frogs," in the September 1985 *Fate.* Author Michael T. Shoemaker quotes an 1867 newspaper account of a farmer who, blasting through rocks, reportedly discovered three frogs "completely imbedded in the rock." The frogs were of normal length, but were only about an eighth of an inch thick, as if flattened out by great pressure. Of course they were still alive and, like the contemporary cartoon character who is flattened by a steam roller and then springs back to his original shape, these miraculous frogs "commenced inflating themselves and growing thicker and in the course of half an hour hopped off."

Apparently Shoemaker is not too troubled by a single rock-entombed flattened frog, but "this unique three-in-one case strains coincidence." Even if the account is true, says he, "the incredible flattening of the frogs cannot be reconciled with orthodox biology."

* * * * *

A terrible thing is starting to happen to those fossilized "human footprints," the ones supposedly found mingling with dinosaur tracks along the banks of the Paluxy River in Texas. John D. Morris, head of the Institute for Creation Research (ICR), reports in the January 1986 issue of his publication *Impact* that "due to an unknown cause, certain of the prints once labelled human are taking on a completely different character." The most significant change is that "in almost each of the prints in the trail, three large 'toes' have appeared, similar to nearby dinosaur tracks." He supplies an illustration contrasting the original appearance of the prints (perfectly human) with how they look now: very much like dinosaur tracks.

Skeptics may wonder why this "unknown cause" started acting up just recently, since the supposedly human footprints seemed to have been unchanged in the more than four thousand years since the Flood in which all the dinosaurs drowned. If this "unknown cause" doesn't stop soon, people may conclude that what Morris and his colleagues have been calling "human footprints" were nothing but dinosaur tracks all along. Morris all but admits this, concluding that "it would now be improper for creationists to continue to use the Paluxy data as evidence against evolution." •

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Occam's Razor

Elie A. Shneour

FOR THE UNINITIATED—and alas, our educational system ensures that they are the vast majority—science seems arcane and unapproachable. With a modicum of intellectual effort, however, almost everyone can partake of its elements, and this makes science potentially the most equalitarian of human endeavors. Had that been recognized, at least following World War II, there would be no need for a CSICOP today, when even high government officials, industrial leaders, publishers, and editors exhibit embarrassing illiteracy in this dominant engine of modern civilization.

Science is an intellectual tool rather than a body of facts. It is the most powerful tool ever devised by the mind of man for the control of his destiny. By contrast, most religions require uncritical beliefs, resignation to earthly fate in silence, and above all that no questions be asked. In return, the believer is assured that all his travail will one day come to an end, to be followed by an afterlife of punishment or reward, determined by his conduct on earth: eternal damnation for the wicked and an idyllic heaven for the just.

Science offers no such powerful reassurances. It can only provide for some insight into the physical world during man's earthly journey, and perhaps some control over his immediate fate. And in the absence of an intellectual handle, science can afford no relief about questions of the existence of an ethical deity or of an afterlife. It ought to be self-evident that ethical principles, empirically arrived at over millennia, must prevail whether a deity exists or not. Would murder be any more acceptable without the Ten Commandments? This transition from hope for an afterlife to hope for this one represents perhaps the most traumatic modern change in the expectations of mankind. It is science that is pushing away the veil of ignorance and superstition to ease that painful transition.

No wonder, then, that the intellectual power of science is frightening to so

Elie A. Shneour is director of the Biosystems Research Institute, La Jolla, California. He is a CSICOP scientific consultant.

many. No wonder that for this reason educational systems worldwide have resisted it and continue to resist it although this is rarely if ever admitted and is instead excused on all kinds of irrelevant grounds. But many people who develop even a cursory acquaintance with what passes for science are awed, if not discouraged or angered, by the pretensions of elitism and condescension exhibited by too many of its more articulate and visible practitioners.

"The honest and simple application of Occam's Razor to paranormal claims would quickly consign most of them to oblivion. It would free their purveyors from frustrating emotional burdens and the waste of resources to accommodate more fruitful pursuits."

That need not be so. There is a fundamental tenet of science that has its greatest and most beneficial immediate impact in the routine matters of human existence. This particular intellectual tool of science is called Occam's Razor. Like many verities, it was first articulated a long time ago, in the Middle Ages, although it appears in different forms in older and more recent texts, i.e., by theologian Durand de Saint-Pourçain in the thirteenth century, and later by Galileo in the defense of his planetary hypothesis.

William of Ockham was an influential Catholic philosopher of the fourteenth century who caused the church a great deal of trouble, was excommunicated, and probably died in the Great Plague of 1349. Ockham is associated with his famous intellectual razor by the enunciation of this principle: *Non sunt multiplicanda entia praeter necessitatem,* which roughly translated means that things must not be multiplied beyond necessity and can also be rendered as "one should not make mountains out of molehills." It affirms that parsimony in thought is usually closest to the truth or that the simplest explanation for an observation is most likely to be the correct one.

The honest and simple application of this principle to paranormal claims would quickly consign most of them to oblivion. It would free their purveyors from frustrating emotional burdens and the waste of resources to accommodate more fruitful pursuits. Thus far, UFO sightings, the Bermuda Triangle, dowsing, biorhythms, astrology, the Loch Ness monster, psi phenomena, and the like have not been able to withstand the scrutiny of Occam's Razor in separating fact from fiction. The following particularly trenchant example is adapted from T. H. Jukes (*Nature,* 285: 130, 1980).

According to the Creation Research Society's Statement of Belief, which must be subscribed to by all its members, the Bible is the written word of God and is scientifically true in all the original autographs. All living things, including man, were created *de novo* by God during Creation week. The Flood, and Noah's part in it, described in Genesis, was a historical event,

worldwide in its extent and effect. The Creation Research Society dismisses all alternatives to this scenario, pointing in particular to the biblical precisions of exact measurements, including the dimensions of the Ark and the duration of the Flood.

The spokesmen of that organization, some of them holders of recognized advanced academic degrees in scientific disciplines, assert that isotopic dating is in error, that Darwinian evolution is in contravention of the Second Law of Thermodynamics, and that the interpretation of the fossil record by modern paleontology is a fallacy. According to them, the only credible explanation for Creation is found in the Bible.

Application of Occam's Razor to the biblical account of the Flood yields the following analysis: Genesis 6-8 give the volume of the three-story Ark as 43,000 cubic meters (1 cubit = 0.46 cubic meter). The Noah team that built the huge Ark and gathered all the balky terrestrial animals (some of them dangerous), together with their monumental and varied food supply for one year, numbered a total of eight persons.

The Bible is silent about the way such a minuscule group of people, with no clearly defined rational means, no pertinent experience, and a critically limited period of time before the Flood was to start, managed the feat. To state that "God provided the means" is not an acceptable explanation in a scientific context. The "materials and methods" must be explicitly described *in extenso* and be credible by at least commonsense criteria before they can be accepted as legitimate science.

Another problem with a literal acceptance of the biblical Ark is that an exquisitely delicate ecological balance exists between living species; many are obligate predators or parasites on the others. There are no explanations of how that balance was retained aboard the Ark. The Ark's insectary would have had to include well above a million species. The aviary, 25,000 or so species of birds. The bulk of the remaining space would have had to accommodate about 15,000 pairs of mammals, 6,000 pairs of reptiles, 2,500 species of amphibians, to say nothing of providing very finicky cultured environments for tens of thousands of microorganisms, some with associated viruses, to have been assembled, catalogued, and kept alive without so much as a microscope. And, if the Bible is the written word of God, how is it that these microorganisms, ubiquitous and essential residents of the planet, are not even mentioned.

Then there is the botanical problem. Nothing in the Genesis story of Noah's Ark is mentioned about plants, although it is self-evident that the Ark had to carry them all, both for food and to replenish the Earth after the flood. But if the account of the Flood is accurate, it rained literally torrents of water. The skies must have been heavily overcast to carry so much moisture, reducing photosynthesis, the foundation of life on earth, to almost nothing. To absorb the residual sunshine and survive, all green plants would have had to remain well separated from one another on deck, assuming that the heavy and continuous downpour did not destroy them and wash them

overboard, along with their retaining soil.

How could all these plants find enough open space on the Ark and still leave room for all the animals? If the total volume of the Ark is equitably divided among all the animal species that populated it, and making no allowance at all for plants, there is less than one cubic meter available for each pair of vertebrates and their food supply for the entire voyage. And what was to be done about the obviously massive waste-disposal problem such a cargo would generate?

By now the reader is conscious of the enormous discrepancies that must be accounted for if the biblical account of the Flood is to be accepted literally. There are many more than I can note here, but a final one deserves mention. It deals with the hydrology of the Flood. In Genesis it is stated that ". . . all the high hills that were under the whole Heaven were covered. . . ." Since Mount Ararat is 17,011 feet high, a very conservative estimate of the maximum depth of the water on the surface of the earth at the end of the Flood would be 10,000 feet. And 15,000 feet would not be an unreasonable figure. Taking the smaller of these two estimates to calculate the volume of precipitation generated in the Flood, we arrive at a figure of *393 million cubic miles* of water, which is 40 percent greater than the total amount of water present on the earth.

There is another way of applying Occam's Razor to these figures: According to the Bible, it rained for 40 days and 40 nights, or for 960 hours. To reach 10,000 feet, it must have rained at a rate of 4 1/3 *feet* of water an hour, a precipitation that would have devastated the ability of any vessel to remain afloat, let alone the survival of its passengers. But assuming that the Ark was able to weather that immense deluge—it took more than 167 days for the water to come down to normal levels—what happened to all that water? It could not find space in the interior of the planet in such a short time without generating awesome Krakatoa-like eruptions. If, on the other hand, it just dissipated into outer space, by a sort of cataclysmic "boiling away," which no living things could reasonably have survived, why and how did it stop just in time to leave rivers, lakes, and oceans behind?

Unless these and related questions can be answered rationally by creationists, or until they stop insisting that theirs is a legitimate scientific subject, only derision and ridicule can be their lot as presumed scientists. Science rests on a bedrock of slowly and painstakingly gathered consistent evidence, born out of careful observation and repeated testing of hypotheses to eliminate inherent human biases. Only when a hypothesis has been shown to fit the observed facts does it become possible to apply rules of formal logic to it and derive consequences with predictive value. Any rational human being is welcome to join the cause of science. There are no statements of belief to execute for membership, only the demonstrable application of reason. •

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Clever Hans Redivivus

Thomas A. Sebeok

THOSE WHO BELIEVE in occasional visits or abiding attendance by alien forces in our midst—that, as Harlow Shapley held, "we are not alone"—usually allude to the descent, via UFOs perhaps, of extraterrestrial creatures. Others believe in the ascent of animals to human society, the unique key for admission to which is their arrogation of mankind's language propensity, assumed by scientists to be a critical attribute of the genus *Homo*.

These presumptions—those that announce incursions from "above" and those that retail encroachments from "below"—are buttressed by a globally pervasive mythological substructure. Since the invention of narrative records, this substructure has blossomed into diverse works of science fiction, the two main trends of which are neatly exemplified in the writings of Edgar Rice Burroughs: his Martian and Venusian romances pointing upwards, and his Tarzan adventure novels foreshadowing goings-on down here. Much to the evident displeasure of the more irresponsible segments of the media and to the disappointment of public hunger for company from beyond, neither of these parallel skeins of yarn has ever been woven solidly into the fabric of science. One of the SKEPTICAL INQUIRER's foremost functions is to equitably adjudicate between fact and fiction.

The oft-told tale of Clever Hans (Pfungst, Christopher, Fernald, Sebeok, Sebeok and Umiker-Sebeok) involves an effect that has been elevated in standard textbooks of psychology to the status of a phenomenon. It also entails a fallacy, compromising the standard model of communicative comportment. The phenomenon refers to the performing horse that responds to questions in such a manner that it seems to consciously grasp them and to possess the requisite knowledge to answer them, often correctly. "The horse was simply a channel through which the information the questioner unwittingly put into the situation was fed back to the questioner. The fallacy," Ray Hyman (1981, 170) explains, "involved treating the horse as a source of the

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message rather than as a channel through which the questioner's own message is reflected back."

Both the phenomenon and the fallacy have very deep historical roots. In England, for example, their origins go back at least to a book by Samuel Rid, a quintessentially skeptical inquirer of Elizabethan times.

Nobody knows the identity of Samuel Rid, or even whether this was his true name or a literary pseudonym, conceivably that of Reginald Scot (S.R. for R.S.?), the author of *Discoverie of Witchcraft* (1584). Some of the latter was copied, word for word, into *The Art of Juggling or Legerdemain* (1612), Samuel Rid's only known work. This book variously sets forth illusions with balls, coins, and cards—attributed by Scot to witchcraft—and tricks with dice, abridged from Gilbert Walker's *A Manifest Detection of Diceplay* (1552). Rid's guide, as was noted by Arthur F. Kinney (1973, 263), belongs to the genre "of an instructional manual, forerunner of our how-to-do-it books." As to its arrangement, being an exposé of a variety of discreditable rogues, while being also a handbook for magicians, this is reminiscent of James Randi's *Flim-Flam! Psychics, ESP, Unicorns and Other Delusions* (1982).

Rid unexpectedly turns, in his penultimate paragraphs (Kinney 1973, 289 f.), to "one pretty knack, which is held to be marvelous and wonderful," namely, "to make a horse tell you how much money you have in your purse." He leads into his concise account by way of a historical example, of a story of a performing ass of Memphis, in Egypt, followed by one meaty paragraph about a horse, unnamed, which is one "at this day to be seen in London." There is little doubt that the horse is none other than the celebrated "dancing horse" Morocco, exhibited by a confidence artist named John Banks, usually stated to be a Scotsman. "This horse," we are informed by J. O. Halliwell-Phillipps (1879 [1835], 21), "was taught tricks and qualities of a nature then considered so wonderful, that the exhibitor was popularly invested with the powers of magic. . . ." Halliwell-Phillipps reviewed the contemporary literature pertaining to the exploits of Morocco and Banks because they were featured by such famous poets as John Donne (1593) and Ben Jonson (1616), among others, and particularly because they are alluded to in Shakespeare's "Love's Labour's Lost" (1598, I.ii.51).

Gervase Markham's curious *Cavelarice* (1607), an early seventeenth-century work on horsemanship, explains in some detail how "strange Morocco's dumbe arithmeticke" (as Bishop Hall [1597, iv. 2] spoke of its faculty) was drummed into the horse:

> Now if you will teach your horse to reckon any number by lifting up and pawing with his feete, you shall first with your rodde, by rapping him upon the shin, make him take his foote from the ground, and by adding to your rod one certaine word, as *Up,* or such like, now when he will take up his foote once, you shall cherrish him, and give him bread, and when hee sets it uppon the ground, the first time you shall ever say *one,* then give him more bread, and after a little pause, labour him againe at every motion, giving him a bit of bread til he be so

perfit that, as you lift up your rod, so he will lift up his foot, and as you move your rod downeward, so he will move his foot to the ground; and you shall carefully observe to make him in any wise to keep true time with your rod, and not to move his foot when you leave to move your rodde, which correcting him when he offends, both with stroakes and hunger, he will soone be carefull to observe. After you have brought him to this perfectnesse, then you shall make him encrease his numbers at your pleasure, as from one to two, from two to three, and so fourth, till in the end hee will not leave pawing with his foote, so long as ever you move your rod up and downe; and in this by long costume you shall make him so perfect that, if you make the motion of your rod never so little, or hard to bee perceived, yet he will take notice of it; and in this lesson as in the other, you must also dyrect him by your eie, fixing your eyes upon the rod and uppon the horsses feete all the while that you move it; for it is a rule in the nature of horsses, that they have an expeciall regard to the eye, face, and countenaunce of their keepers, so that once after you have brought him to know the helpe of your eye, you may presume he will hardly erre except your eye misguide him; and therefore ever before you make your horse doe any thing, you must first make him looke you in the face. Now after you have made him perfit in these observations, and that he knowes his severall rewardes, both for good and evill dooings, then you may adventure to bryng him into any company or assembly, and making any man think a number, and tell it you in your eare, you may byd the horse tell you what number the man did thinke, and at the end of your speech bee sure to saye last *Up:* for that is as it were a watchworde to make him know what hee must doe, and whylest you are talking, you shall make him looke in your face, and so your eye dyrecting him unto your rodde, you may with the motions thereof make him with his foot declare the number before thought by the by-stander. From this you may create a world of other toyes, as how many maydes, howe many fooles, how many knaves, or how many rich men are amongst a mustitude of gazing persons, making the worlde wonder at that which is neyther wonderfull nor scarce artificiall." [Halliwell-Phillipps 1879, 39–42]

What is so remarkable about Samuel Rid's exposition is its thoroughly modern aspect, couched in the terminology of current semiotic and nonverbal communication studies. Rid says, for example, that the horse's master

will throw you three dice, and will bid his horse to tell how many you or he have thrown. Then the horse paws with his foot whiles the master stands stone still. Then when his master sees he hath pawed so many as the first dice shews itself, then he lifts up his shoulders and stirs a little. Then he bids him tell what is on the second die, and then of the third die, which the horse will do accordingly, still pawing with his foot until his master sees he hath pawed enough, and then stirs. Which, the horse marking, will stay and leave pawing. And note, that the horse will paw an hundred times together, until he sees his master stir. And note also that nothing can be done but his master must first know, and then his master knowing, the horse is ruled by him by signs. This if you mark at any time you shall plainly perceive. [Kinney 1973, 290]

Every reader of this passage who is familiar with the Clever Hans phenomenon will instantly recognize Rid's description; some may wonder why Oskar Pfungst, so expert in the methodology of scientific research (Fernald 1984; Sebeok 1985a, 1985b) ignored Rid's testimony, so cognizant about elementary techniques of conjury.

"Both the logical design and the variety of cop-outs employed by those who seek to evoke a language capacity or arithmetic proclivity in wild cetaceans, pinnipeds, or primates are identical to those used by some investigators of paranormal happenings."

Rid was not the only one the thorough Pfungst should have known about. The cunning Thomas Dekker (1606), who knew this exhibition well, informs us that Banks's feats were accomplished "onely by the eye and the eare," that is, by nonverbal and verbal signs. Thomas Killigrew (1664) gave similar testimony, mentioning a woman who "governs them with signs and by the eye, as Banks breeds his horse. . . ." These are among many comparable accounts of wondrous horses and other learned domestic animals of all sorts preceding and following the authoritative studies of Pfungst. (Christopher [1970, 39-54] discusses some of these; see also Sebeok 1979, 1981.)

In the 1950s, a distancing transformation took place. Although domestic animals continued to be trained to perform seemingly miraculous acts, the emphasis decidedly shifted from the familiar to the exotic: to creatures that dwell in the depths of the oceans, especially dolphins, or in remote African and Indonesian jungles, including most of the great apes (two species of chimpanzees, the gorilla, and the orangutan). While John Banks and his fellows practiced outright deception, for the straightforward and honorable purpose of increasing their income, the bully pulpit of today is the academic laboratory, supported with federal funding or by private corporate donations, connived at by the press and television.

Lewis M. Branscomb (1985, 421) has put the matter elegantly: "I am afraid that a great many scientists deceive themselves from time to time in their treatment of data, gloss over problems involving systematic errors, or understate the contributions of others. These are the 'honest mistakes' of science, the scientific equivalent of the 'little white lies' of social discourse. But unlike polite society, which easily interprets those white lies, the scientific community has no way to protect itself from sloppy or deceptive literature except to learn whose work to suspect as unreliable. This is a tough sentence to pass on an otherwise talented scientist." A host of problems stem from self-deception of this sort, as we have documented elsewhere (Sebeok and Umiker-Sebeok 1979, 1981-1982).

Skeptical inquirers need to be mindful that both the logical design and

the variety of cop-outs employed by those who seek to evoke a language capacity or arithmetic proclivity in wild cetaceans, pinnipeds, or primates are, in numerous and significant particulars, identical to those used by some investigators of seemingly paranormal happenings. That these likenesses are by no means coincidental needs to be spelled out in these pages at an early opportunity: We need to understand how the goal can be so different yet the strategy remain the same.

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Parapsychology, Miracles, and Repeatability

Antony Flew

DAVID HUME (1711-1776), the first of the two great philosophers of the eighteenth-century Age of Enlightenment, was also the first thinker of the modern period to develop systematically a world outlook that was thoroughly skeptical, this-worldly, and man-centered. A friend and admirer of Benjamin Franklin, living just long enough to hear of and to welcome the American Declaration of Independence, Hume was the philosophical founding father of what is in the United States today so widely and so fiercely denounced as "secular humanism."

The immediate concern of the SKEPTICAL INQUIRER, however, is with only twenty or thirty pages of all of Hume's writings. These few pages, the treatment "Of Miracles" in *An Inquiry Concerning Human Understanding,* provoked in his own lifetime more protest and controversy than most of the rest of Hume's published work put together. He believed that he had "discovered an argument . . . which, if just, will, with the wise and learned, be an everlasting check to all kinds of superstitious delusion, and, consequently, will be useful as long as the world endures. For so long, I presume, will the accounts of miracles and prodigies be found in all history, sacred and profane."

Hume himself, like his contemporary critics, was most interested in "the accounts of miracles and prodigies" found in what in those days people still distinguished as "sacred history." Above all, both he and his critics were concerned with the application of his "everlasting check" to accounts of the resurrection of Jesus. For then all parties agreed that this allegedly well-evidenced alleged event constituted both the best reason for accepting that the Christian candidate is a genuine revelation and one essential element in that revelation.

Here my own primary concern is with the phenomena, or putative phenomena, of parapsychology as they appear, or appear to appear, in an

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entirely secular context. So far, no one seems to have appreciated the full significance for parapsychology of Hume's argument. For those who prefer the big words, it is an epistemological rather than an ontological argument. It is directed not at the question of whether miracles occur but at the question of whether—and, if so, how—we could know that they do, and when and where they have.

"It is simply grotesque to complain, in the absence of decisive falsifying evidence, that appeals to the Basic Limiting Principles and the named laws of established physics are exercises in a priori dogmatism."

Hume's argument takes off from an observation about "the very nature of the fact" or, better, the logic of the concept. Since a miracle must essentially involve an overriding of the ordinary order of Nature, presumably by some supernatural power, there is bound to be an irresolvable conflict of evidence. Since all evidence for insisting that some conceivable occurrence (were it in fact to have occurred) constituted such an overriding of the natural order must at the same time and by the same token be evidence against the contention that the particular principle precluding occurrences of this particular kind is in fact an element in that order; and, of course, also the other way about.

It is unfortunate that Hume disqualified himself from exploiting the full potentialities of this most promising gambit. In his zeal to defend his great negative insight about causation—"If we reason *a priori,* anything may appear able to produce anything"[1]—he denied the crucial notions of physical necessity and physical impossibility.[2] In his official view, the relation of cause to effect is no more than a regularity of observed precedence and succession; there is no explicit and explained reference to the need for efforts either experimentally to break or actively to exploit such merely observed correlations. No combination of statements—each expressible as what is misleadingly called a "material implication"—can be got formally and rigorously to entail any contrary-to-fact conditional (such as, "If this were to have happened—though it did not—that would have followed). Yet every causal proposition as well as every nomological proposition—every proposition expressing a law of nature—does carry contrary-to-fact entailments. If you say, to take a homely illustration, that the cause of the trouble was that there was no gas in the tank, then your statement implies that, had the tank been full, all other things being equal the engine would have started.

Hume's accounts both of causation and of laws of nature are therefore grossly inadequate. Another way of bringing out both the nature and the

severity of these deficiencies is to say that Humian causes, unlike real causes, do not bring about their effects. They do not, by themselves, make the occurrence of their effects physically necessary and all alternative eventualities, in precisely that existing situation, physically impossible. Nevertheless, and very understandably, in his discussion "Of Miracles" Hume wants to make much of a distinction for which he cannot himself find room. Thus he argues: "But in order to increase the probability against the testimony of witnesses, let us suppose that the fact, which they affirm, instead of being only marvelous, is really miraculous."

To be "really miraculous," as opposed to being "only marvelous," is to be physically (or practically or contingently) impossible, as opposed to being an event merely very rare, unusual, or surprising. It is precisely and only because (it is believed that) it would be in this everyday sense impossible for any power within the universe, human or nonhuman, to bring about a "really miraculous" event that religious people would say that, were it to occur, it would have to be the work of some supernatural power.

That is not a question for us to pursue here. What is, however, both relevant and important is that psi phenomena, the putative subject-matter of parapsychology, are, or would be, phenomena whose occurrence all of us—including most of the time the believing and practicing parapsychologists themselves—would with complete confidence rule out as physically (or practically or contingently) impossible. This point has in a way been recognized by all those who have insisted that psi phenomena are (or would be) inconsistent with (what are currently believed to be) the laws of physics. This is, I believe, most of what J. B. Rhine and others have had in mind when they have claimed that psi phenomena are (or would be) *non*physical.

But the truth, as C. D. Broad argued long ago in a landmark paper,[3] is that the Basic Limiting Principles that rule out such goings on as, in this sense, impossible are less sophisticated than the development of physical science. They also have been, and remain, largely independent of its development. Broad originally stated these Basic Limiting Principles in a highly abstract way. Both their nature and their importance will come out more clearly in the concrete.

Suppose, for instance, that there has been yet another security leak in Washington, or Bonn, or London. Then everyone, or almost everyone, assumes that some hostile agent has had some form of direct or indirect sensory access to the Top Secret material that is now secret no longer. It never seriously enters most people's heads that that material might have been telepathically or clairvoyantly "read" by an agent who at no time came within normal sensory range. Extrasensory perception (ESP) is thus in practice ruled out as impossible. That information cannot be acquired without employment of the normal senses is precluded by a Basic Limiting Principle (BLP).

Suppose that there had actually been an explosion in the nuclear power station at Three Mile Island. No one, or almost no one, would have suggested

that this might have been a case of sabotage by psychokinesis (PK). That too is precluded as practically impossible by another BLP.

A second thing to notice about these BLPs, in addition to the fact that they are both familiar and more fundamental than any of the named laws of physics, is that to appeal to them as reasons for dismissing some alleged occurrence as physically (or practically or contingently) impossible is not—any more than to appeal in a similar context to some named law of established physics—to dismiss such allegations dogmatically and apriori.

Many contributors to the SKEPTICAL INQUIRER, including some fellows of CSICOP, are quite unnecessarily embarrassed by, while making dreadfully heavy weather of, such charges of apriori dogmatism. Certainly, since none of us is infallible, we ought to be always ready to consider any strong evidence suggesting that some proposition we had believed expressed a true BLP or a true law of nature is, after all, false. Yet it is simply grotesque to complain, in the absence of any such decisive falsifying evidence, that these appeals to the BLPs and the named laws of established physics are exercises in apriori dogmatism. For what "apriori" means is: prior to and independent of experience. But in both of these kinds of cases we have an enormous mass of experience supporting our present beliefs and our present incredulities.

So, now, what sort of evidence should we demand as sufficient to show that we had been mistaken in dismissing all alleged psi phenomena (ESP and PK) as physically impossible? When, back in 1955, G. R. Price made the first attempt to deploy Hume's argument "Of Miracles" as a challenge to parapsychology, Price called not for a demonstration *type* but a demonstration *token*.[4] He demanded not an algorithm for producing psi phenomena at will, whenever and wherever required, but rather a single, once-and-for-all decisive, knock-down falsification of one or all of the precluding BLPs. In this, Price revealed that he had not appreciated the full richness and strength of Hume's argument.

What needs to be remembered is that already, when publishing the first *Inquiry,* Hume had for some time been intending to devote his future to history. The Catalogue of the British Library still puts our greatest philosopher down as "Hume, David, the historian." The section "Of Miracles" is thus, among other things, an examination of the presuppositions of critical history.

In effect, Hume's thesis is that the detritus of the past can only be interpreted as historical evidence—and, as such, employed to tell us what actually happened—by applying to it everything we know, or think we know, about what is probable or improbable, possible or impossible. Confronted with a story of a miracle, or of any other story that he knows, or believes he knows, to be impossible, the critical historian is therefore required to reject it as a fiction. Hume gives as an example of sound historical practice the reaction of the famous physician De Sylva to the case of Mademoiselle Thibaut: "The physician declares, that it was impossible she could have been so ill as was proved by witnesses; because it was impossible she could, in so short a time, have recovered so perfectly as he found her. He reasoned, like a man of

sense, from natural causes."

What, regrettably, Hume did not allow for was the possibility that later historians, following the same sound methodological principles but having the advantage of further scientific findings, might have to admit that some of the stories in question had after all been true—although the events thus truly recorded were not miraculous. For instance, the stories of supposedly miraculous cures wrought by the Roman Emperor Vespasian in Egypt, stories ridiculed by Hume and all like-minded contemporaries, would, in the light of advancing knowledge of psychosomatic possibility, appear to have been true.[5]

"If people really were able to exert some force at a distance on other objects at will, then we should have expected this to be demonstrated by the use of some extremely delicate and very carefully shielded apparatus."

The moral for us is that any supposedly once-and-for-all-decisive yet not-in-practice-repeatable demonstration of the reality of psi phenomena has to be rejected. It has to be rejected in the same emphatic way, and for the same excellent reasons, that critical historians reject stories of what they know, or believe they know, to be physically impossible. So to the objection that there are some rare phenomena that, though not repeatable at will, are admitted by science, the correct and properly crushing reply should be that these are not phenomena for which we have the strongest or indeed any experimental reasons for thinking impossible.

There are three further reinforcing reasons why we have to demand full repeatability and to refuse to accept any substitute.

1. In the first place, parapsychology is by now a fairly old subject. The (original, British) Society for Psychical Research was founded in 1882. Serious work has been going on for more than a century, while the amount done each year appears still to be increasing. Nevertheless, the long sought repeatable demonstration of any psi phenomenon seems to be as far away as ever. It is still stubbornly the case that those best-informed about the field automatically assume that anyone claiming to demonstrate psi capacities with night-after-night regularity must be some sort of fraud, achieving their effects by mere conjuring tricks. So long as this situation continues, there will every year be better and better reason to close the books, concluding that the whole business was a wild-goose chase up a blind alley.

Another dampening and damaging feature of the history of the subject is the ever lengthening succession of shameful, shabby cases—cases that at one time and to many people had seemed to constitute knock-down demonstrations of the reality of these putative phenomena but have since been defini-

tively discredited as fraudulent. For instance, this applies to every one of the cases commended by the various contributors to J. Ludwig's *Philosophy and Parapsychology* (Prometheus, Buffalo, 1978). In particular, it is true of the once famous and now notorious work of S. G. Soal on Gloria Stewart and Basil Shackleton.[6] Soal's sharply righteous reply to G. R. Price falls now upon disillusioned ears.

2. The second reason for viewing the whole business with the deepest suspicion, and the second reason reinforcing the demand for repeatability or nothing, is the fact that no one has been able to think up any halfway plausible theory accounting for the occurrence of any psi phenomenon. This is important, because a plausible theory relating these putative phenomena to something that undoubtedly does occur would tend both to explain and to probabilify their actual occurrence.

3. Third, and finally, there are the reasons arising from the fact that all the psi concepts are negatively defined. This important truth is often overlooked because such expressions as "by telepathy" and "by psychokinesis" sound like the expressions "by telephony" and "by psychoanalysis." But the fact, of course, is that all the psi terms refer rather to the absence of any means or mechanism, or at any rate to the absence of any normal and understood means or mechanism.

One consequence is that no sense has been given to a distinction between single hits achieved by ESP and single hits due to chance alone. Only when, after a series of guesses (or whatever) has been made and has been scored up against the targets, it turns out that there have been significantly more hits than we could have expected by chance alone are we entitled to begin to talk of psi, or of a psi factor. The phenomenon, therefore, is—so far, at least—defined as essentially statistical. Furthermore, and despite some protests to the contrary, the same applies not only to the experimental work but also to the supposed spontaneous or sporadic phenomena. If, for instance, someone has a dream of a maritime disaster "on the night when the great ship went down," then there is no way of identifying this dream as a psi phenomenon save by summing single items of correspondence between dream and reality and arguing that there are too many correspondences, and too few noncorrespondences, to be put down to chance alone.

PK, on the other hand, should not be similarly statistical. Nor would it have been had the evidence actually offered been what we ought to have expected. For, if people really were able to exert some force at a distance on other objects at will, then we should have expected this to be demonstrated by the use of some extremely delicate and very carefully shielded apparatus. If the subject's willings were always followed by the occurrences of the willed movement, and that movement was one that we had taken every care to ensure would not otherwise occur, then we would be home and dry; and, presumably, we should in this have a repeatable demonstration.

But the actual "dice work" has been different. In fact, it is once again essentially statistical. A batch of dice are tossed mechanically, and the subject

is told to will them all to come up on one particular side. The procedure is repeated ad nauseam, and well beyond. The experimenter's hope is that he will find significantly more willed sides turning up than chance alone would lead us to expect. If that hope is fulfilled, the experimenter reports a PK effect. So, once again, no operational sense is in fact given to the notion of a single PK hit, as opposed to a run of falls suggesting the operation of a PK factor.

The second and further consequence of all this is that there is no way of decisively identifying even a single run in which a psi factor was operating. Since no identifiable means or mechanism is being employed, it must remain always possible to say that any single run was no more than a statistical freak—however improbable, not impossible. There is therefore once again no substitute for what there is ever less reason for expecting we shall in fact get—namely, a repeatable demonstration, showing psi phenomena being produced and inhibited at the will of the experimenters and/or their subjects. Only this would really demonstrate that the targets actually are causing the subjects to come up with correct guesses and/or that subjects actually are influencing the fall of the dice.[7]

Notes

1. Hume, of course, rendered the expression *a priori* as two words, printed in italics. Since the first employment recorded in the big *Oxford English Dictionary* was in 1710, in Berkeley's *Principles,* it is surely more than time to grant it citizenship in the English language. We shall render it, as I do below, as a single unitalicized word.

2. See, for a more adequate treatment of the immediately relevant points both of philosophy and of Hume interpretation, "Another Idea of Necessary Connection," in *Philosophy,* 57(1982):487-494.

3. "The Relevance of Psychical Research to Philosophy," in *Philosophy,* 24(1949):291-309.

4. See "Science and the Supernatural," in *Science,* 131 (1955): 359-367.

5. For further discussion, compare either Chapter 8 of my *Hume's Philosophy of Belief* (London and New York: Routledge and Kegan Paul, and Humanities, 1961), or the Introduction to the separate printing of the section "Of Miracles," which should, by the time the present article appears, have been published by Open Court of LaSalle, Ill.

6. The Amazing Randi loves to say that academics, and especially philosophers, find it hard to say either "I don't know" or "I was wrong." So let me say here and now that in my first book, *A New Approach to Psychical Research* (London: C. A. Watts, 1953), I was totally wrong about, among other things, this now wholly discredited research.

7. Readers wanting to pursue somewhat further the questions raised in this essay are referred to Antony Flew (Ed.), *Philosophical Readings in Parapsychology* (Buffalo: Prometheus, forthcoming). •

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The Condon UFO Study: A Trick or a Conspiracy?

There was indeed a plot to mislead the public. Condon and Low were its victims.

Philip J. Klass

JUST 20 YEARS AGO, the University of Colorado undertook a very controversial project that was unique in the annals of university research. At the request of the U.S. government, the university agreed to perform a two-year scientific investigation into Unidentified Flying Objects—UFOs. That effort probably brought more fame to the University of Colorado—and certainly more criticism—than any other activity ever to take place on its campus.

The late Edward U. Condon, a world-famous physicist who once had directed the National Bureau of Standards with distinction and who was then a member of the Colorado faculty, reluctantly agreed to head the UFO project. He became a favorite whipping-boy of the UFO cultists. Robert Low, another faculty member, who served as the project coordinator and later died in an aircraft accident, was defamed in the national news media on the grounds that he and Condon had plotted to "trick" the American public.

There was indeed a plot to mislead the public. *But Condon and Low were its victims, not its architects.* A small group of "UFO-believers," which included a U.S. congressman, secretly plotted to discredit the Colorado effort. Today we can piece together their covert actions because of fortuitous access to the files of the chief architect of the plot, who later committed suicide.

Let me emphasize that I cannot endorse the Colorado investigation as having been well managed. In my opinion, Condon himself did not play a sufficiently active role, and Low had no prior experience in coordinating so complex an investigation. But under the circumstances, I doubt that anyone could have done much better. And those who later plotted to discredit the

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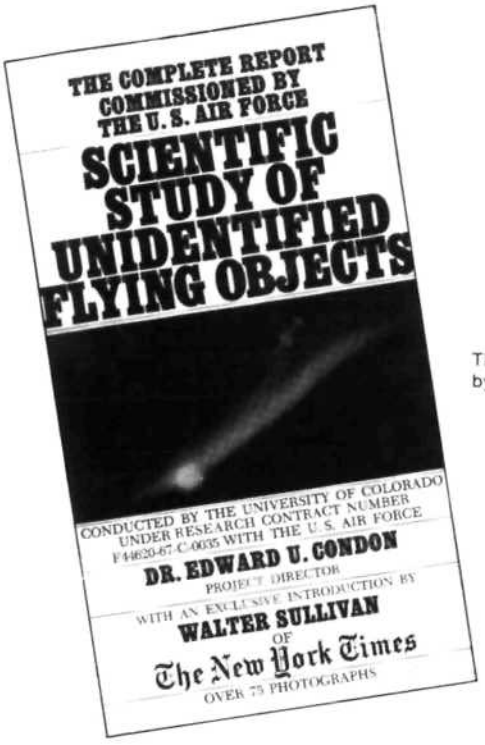

The Condon Report, as published by Bantam.

Colorado effort would surely have done far worse had they directed the program.

But first let us turn back the clock to the spring of 1966 for the benefit of those who are too young to recall the circumstances and for those whose memories have dimmed because of the passage of two decades.

By the spring of 1966, the U.S. Air Force had been investigating UFO reports for nearly 20 years—more than 10,000 of them. At first there were some within the USAF who suspected that some UFO reports might involve extraterrestrial spacecraft, or possibly Soviet reconnaissance vehicles, perhaps built with advanced technology obtained from German scientists captured at the end of World War II.

But, by the early 1950s, having learned that many seemingly mysterious UFO reports had been generated by prosaic trigger-mechanisms, such as bright celestial bodies, weather balloons, and meteor-fireballs, the USAF concluded that all UFO reports were explainable in prosaic terms. And so the USAF assigned only low-level personnel—many of them without appropriate training—to investigate UFO reports. Thus it is not surprising that in some instances these relatively unskilled investigators had trouble finding rational explanations and that there remained a small percentage of unex-

plained cases. For those eager to believe in alien spaceships, these unexplained cases seemed to be proof of their fondest hopes.

Sometimes USAF investigators offered explanations that evoked sharp criticism, and with good reason. For example, in March 1966, UFO reports from university students and others in southern Michigan attracted national attention after the USAF's investigator—astronomer J. Allen Hynek—suggested that some of the reports might be due to swamp-gas. This explanation aroused much ridicule and criticism, even from some members of Congress, including a then obscure Michigan congressman named Gerald Ford.

This criticism of the USAF's handling of the UFO issue and charges that it was guilty of a coverup prompted the USAF's scientific advisory board to recommend that an independent UFO study be conducted by one or more universities. But, when well-known scientific institutions like MIT were sounded out, none of them was willing to undertake such an effort.

During the late spring and early summer of 1966, as the USAF struggled to find a prestigious scientist and institution willing to tackle the UFO study, a member of the faculty of the University of Arizona was lobbying to obtain the contract. His name was James E. McDonald, an atmospheric physicist who was respected by his peers. There was, however, a basic obstacle for McDonald. *He already was convinced that some UFOs were extraterrestrial craft.* This clearly made it impossible for him to direct or conduct an independent, unbiased investigation.

Condon, who had earlier served as president of the American Physical Society and of the American Association for the Advancement of Science and was a member of the respected National Academy of Sciences, had recently joined the Colorado faculty to devote his later years to research in atomic physics.

Robert Low, then assistant dean of the Colorado graduate school, was considerably younger than Condon. He recognized the potential pitfalls of the UFO investigation, but he believed that the project offered the university the opportunity to achieve wider recognition as a center of scientific excellence and that it could be a useful stepping stone in his own academic career. Events would prove Low to be wrong on both counts.

After weeks of internal debate over whether to take on the program, the university submitted its formal proposal in early October 1966, and on October 7 the USAF announced that Colorado had been selected. A key proviso in the Colorado proposal, which was included in its contract, was the following: "The work will be conducted under conditions of strictest objectivity *by investigators who, as carefully as can be determined, have no predilections or preconceived positions on the UFO question.*" (Emphasis added.)

This was a vitally important condition, because the Colorado group would sit in scientific judgment, much as a jury in a court of law, whose members must swear that they have no prior view on the issues under trial. I suspect, but have no proof, that this proviso was intended to foreclose any direct

participation by McDonald. The University of Colorado subsequently awarded subcontracts to several outside institutions and specialists, but none ever went to McDonald.

However, this key provision was violated immediately when David R. Saunders joined the project as one of its three top scientists—referred to as "principal investigators." Saunders was a member of the university's psychology faculty, but it soon became quite evident that Saunders was at least a "quasi-believer," as one of the younger scientists in the project soon characterized him to his face.

Saunders subsequently acknowledged publicly that he had become interested in UFOs at least several months before the USAF contract was awarded. After reading a best-selling "gee-whiz" type book titled *UFOs—Serious Business,* written by a strongly pro-UFO author, Saunders had visited the headquarters of the National Investigations Committee of Aerial Phenomena (NICAP)—then the nation's largest group of UFO believers—to meet with officials and to join the organization.

It was Saunders who played the key role in getting Condon and Low to agree—using Saunders's own words—that "we ought to concentrate on trying to identify and develop cases that might support the extraterrestrial intelligence hypothesis."[1] Saunders also embraced the cornerstone of the UFO-believers' faith that the U.S. government was involved in a UFO coverup. As Saunders later wrote: "Almost from the first day of the Project, I had maintained that a 'government conspiracy' to conceal the 'truth about UFOs' from the public was an even more likely hypothesis than ETI."[2]

Saunders was well aware of the provision against hiring investigators who had any "predilections or preconceived positions on the UFO question" contained in the USAF contract and the university proposal, because Saunders himself had participated in writing that proposal. Yet he did not disqualify himself from participation on those grounds.

Condon and Low tried to establish a good working relationship with NICAP officials from the beginning. NICAP director Donald Keyhoe and assistant director Richard Hall accepted an invitation in the fall of 1966 to visit Boulder to brief project scientists. Following this meeting, NICAP officials offered a curious endorsement of Condon and his associates in the January-February 1967 issue of the NICAP publication, *The UFO Investigator.* The article said: "It probably is fair to say that the scientists on the project range from open-minded skeptics *to moderately convinced 'believers'—which is as it should be."* (Emphasis added.)

While NICAP officials clearly were pleased to find "moderately convinced believers" on the Colorado project shortly after the investigation began, if their assessment was correct, then the terms of the USAF contract had been violated.

McDonald also was invited to Boulder in the fall of 1966 to brief the Colorado team. He returned again in the summer of 1967 to brief the project scientists on the results of his own investigations into UFO reports from

Australia and New Guinea. But, beyond this, Condon and Low did not avail themselves of McDonald's frequent offers to become more directly involved in the investigation.

J. Allen Hynek also was invited to come to Boulder to brief its team on his own views about UFOs. But the then leading experienced UFO-skeptic, the late astronomer Donald Menzel, was never invited to visit Boulder. Nor was I, although I had offered my services as a consultant early in the program.

In June 1967, about halfway through the investigation, the Colorado team was joined by Norman E. Levine, who had just received his Ph.D. in electrical engineering from the University of Arizona. Levine publicly acknowledged that his own interest in UFOs had been sparked by McDonald. Shortly after Levine joined the staff, I happened to talk with him on the telephone when I placed a call to Low, who was out of town. During the discussion, I was shocked to hear Levine express views on UFOs that were remarkably similar to those voiced by McDonald, especially since Levine had just joined the project.

The Colorado game-plan was to dispatch a small team of scientists to investigate important UFO-sighting reports. To ensure that these were promptly reported to the project, an "early warning network" of several dozen persons around the nation was created, consisting principally of NICAP's own field investigators. Shortly after Levine joined the project, he was named "secretary" of the field investigators to coordinate their efforts. As a result, Levine and Saunders played key roles in determining which UFO reports deserved field investigation.

On September 4, 1967, nearly a year after the investigation began, Saunders spoke before the American Psychological Association at its annual meeting in Washington, as a member of a panel during a session on UFOs. During the question-and-answer period, Saunders was asked: "What is your opinion of the scientific integrity of the Condon Committee?" Saunders replied: ". . . I would not wish to remain associated with anything but an open and impartial investigation."[3] Considering Saunders's own pro-UFO views and the key role that he and Levine were playing in the project, his answer is hardly surprising. He remained with the project until the following February 7, when he was fired, along with Levine.

Saunders chose not to reveal to the APA meeting that he was somewhat unhappy with Condon and Low because a few weeks earlier they had rejected two of his suggestions. One of these was that the project should not wait to make its final report before "going public" with some of its interim case-investigation results. Saunders wanted to release those that he believed supported the extraterrestrial hypothesis as well as those that did not.

Saunders's second suggestion was that the Colorado project should encourage public discussion "of the social problems that the world would have to face if either our study or some future study were to generate conclusive evidence of extraterrestrial visitations."[4]

The decision by Condon and Low to reject these two suggestions was a

very wise one at the time, and certainly in retrospect. Condon, and the project, had been criticized earlier—with good reason—because of several speeches Condon had given early in the effort in which he revealed his strong skepticism about UFOs' being extraterrestrial visitors. As a result, the decision had been made to hold back further public discussion until the final report was issued. Saunders himself had violated that policy by agreeing to speak to the APA without obtaining advanced approval to do so.

Were it not for McDonald's tragic suicide in June 1971 and the fact that a young graduate student named Paul McCarthy, at the University of Hawaii, decided to write his Ph.D. thesis on the UFO controversy, the world would never have known of the covert effort spearheaded by McDonald to torpedo the credibility of the Colorado investigation.

Young McCarthy, who honestly characterized himself as being a "UFO-believer," obtained permission from McDonald's widow to gain access to all of his personal papers. Because of McCarthy's strong pro-UFO views and his understandable sympathies for McDonald in the wake of his tragic death, it seems likely that McCarthy left out at least some "incriminating evidence" from his thesis, completed in late 1975. But there is enough to piece together the curious puzzle.

McDonald had himself become such a fanatical believer in UFOs' being alien craft and the greatest scientific mystery of this century that at first he was certain the Colorado group would reach the same conclusion. If it did, then almost certainly the government would then authorize a massive followup UFO investigation, which McDonald would be the logical person to direct because of his expertise. Condon and Low indicated no interest in conducting followup studies. But if Condon and Low remained unconvinced and the two project leaders reached a "negative" conclusion, then McDonald's ambitions would be dashed.

From McCarthy's thesis we learn that, when McDonald returned from Boulder in early August 1967, after briefing the Colorado team on the results of his own UFO-case investigations in Australia, he was discouraged. McDonald so indicated in his letter of August 11, 1967, to Mary Lou Armstrong, administrative assistant to the project. In McCarthy's thesis he notes: "McDonald could talk and write openly to Armstrong and a few others, although Condon and Low, the leaders, remained at a distance." [5]

It was at about the same time—August 1967—that a member of the project, believed to have been Mrs. Armstrong, discovered a memo that had been written a year earlier by Robert Low. In this memo, dated August 9, 1966, Low expressed his *personal ideas* on whether the university should take on the UFO study. By late April 1968, the contents of this memo would be the cornerstone of a feature article in *Look* magazine charging that the Colorado investigation was "a half-million dollar 'trick' to make Americans believe the Condon committee was conducting an objective investigation."

The *Look* article was written by John G. Fuller, who earlier had authored two pro-UFO books. Later, Fuller wrote a book endorsing a famous South

American "psychic surgeon," and still later a book claiming that some Eastern Air Lines jetliners were haunted by the ghosts of members of a flight crew killed in a tragic accident.

As we consider the contents of Low's memo, we should remember that it was written at a time when there was strong disagreement among faculty members over whether the university should undertake the effort. Low's memo, entitled "Some Thoughts on the UFO Project," was addressed to E. James Archer, dean of the graduate school, and to Thurston E. Manning, vice-president for academic affairs.

His memo noted that those who opposed university involvement felt that "to undertake such a project one has to approach it objectively. That is, one has to admit the possibility that such things as UFOs exist. It is not respectable to give serious consideration to such a possibility. Believers, in other words, remain outcasts." But Low quoted another scientist at a separate research center in Boulder, who favored taking on the project, saying: "We must do it right—objectively and critically . . . having the project here would not put us in the category of scientific kooks."

Low's memo drew an analogy with the ESP experiments that had been conducted in the 1930s by J. B. Rhine at Duke University. Low noted that "the Duke study was done by believers who, after they finished, convinced no one. Our study would be conducted almost exclusively by non-believers who, although they couldn't possibly prove a negative result, could and probably would add an impressive body of evidence that there is no reality to the observations."

Then followed the sentence that later would prove so embarrassing. Low wrote: "The *trick* would be, I think, to describe the project so that, to the public, it would appear a totally objective study, but to the scientific community would present the image of a group of non-believers trying their best to be objective but having an almost zero expectation of finding a saucer." (Emphasis added.)

For most Americans, the word *trick* has a devious meaning, but according to the *Randon House Dictionary of the English Language* "trick" also means "the art or knack of doing something skillfully." That is a meaning more often used by the British and members of the British Commonwealth.

For example, in early 1978, Canadian and U.S. scientists were trying to locate radioactive debris from a Soviet satellite that had reentered prematurely over Canada's Northwest Territories. A United Press International article on the incident quoted a Canadian scientist, named Jack Doyle, as saying: "The *trick* at the moment is to convert blips on our [instrument] tapes to something we can see on the ground." (Emphasis added.) Robert Low had studied at Oxford University and, during our brief meeting in Washington, I noticed that he had acquired some British speech affectations and word usages. But I acknowledge that it is not possible today to know for sure what meaning he intended in his now infamous memo.

The important thing, however, is whether Saunders and McDonald were

'Condon, the True Scientist, Understood Self-Deception'

Useful insights into the controversy that swirled around the University of Colorado UFO study are offered by Lewis M. Branscomb, chief scientist and vice president of IBM, who in the mid-1960s was chairman of the Joint Institute for Laboratory Astrophysics (JILA) on the university's Boulder campus. Branscomb knew well both Edward U. Condon, who directed the UFO study, and Robert Low, the project administrator. A copy of the accompanying article was submitted to Dr. Branscomb for comments and his response included the following:

"I know first hand that Bob Low did indeed use the word 'trick' in the sense you defined . . . Scientists, American as well as British, frequently use it to mean a clever or ingenious solution to a problem. The word 'scheme' has a similar ambiguity. (That episode taught me a lesson, and I have avoided using 'trick' in that sense.) . . .

"Condon originally requested that the UFO project be undertaken within JILA, and the proposition was debated by the Fellows. We declined, in part because . . . Condon declined to put in place a set of committed procedures and safeguards that we felt would be necessary to preserve the integrity of so controversial a project. . . . Some of us were concerned that he trusted too many people and might well be victimized, as indeed happened. . . .

"I remember, vividly, a long discussion with Ed Condon in his office . . . when he was considering taking the [UFO] project on. He told me he thought the chances that he could find evidence for a UFO of extraterrestrial origin was infinitesimal, a million-to-one-shot. 'But,' he said with the gleam in the eye that betrays a true scientist on the track of remarkable discovery, 'if there is a chance, even the most remote chance that there is something there, I want to be the one to discover it.'

"In that sense, he and McDonald shared the same motivation, coming from opposite intellectual traditions. Each of them wanted a shot at the immortality that would come from the most astonishing discovery in human history. Unlike McDonald, however, Condon, the true scientist, understood self-deception. The stronger the incentive to discover, the greater the temptation to let down one's guard," Dr. Branscomb noted.

—P.J.K.

surprised and shocked when they first read the memo and concluded that Low and Condon had resorted to devious skullduggery. According to the book that Saunders later wrote, he was neither shocked nor surprised, because the memo "did *not* say anything new—it merely expressed concisely what we

knew anyway on the basis of Low's day-to-day behavior."[6] If Saunders believed at the time that Low's memo offered evidence of skullduggery, he could, and should, have mentioned it several weeks later when he met with vice-president Manning to complain because Condon and Low had rejected his two suggestions. *Yet Saunders did not even mention the Low memo to Manning.*

It is not known with certainty when McDonald first learned of the Low memo. Based on his very close relationship with Levine and Mrs. Armstrong, both of whom saw the memo in August 1967, it would be logical to expect that they had promptly informed McDonald.

Around mid-September 1967, Condon spoke on UFOs at the Atomic Spectroscopy Symposium at the National Bureau of Standards. Condon focused on humorous cases, such as those involving persons he had interviewed who claimed to have made contact with UFOnauts, as well as some incidents that had been exposed as hoaxes. McDonald was especially disturbed by Condon's remarks and wrote to Low to complain, but received no reply.

According to McCarthy's thesis, "Condon's National Bureau of Standards talk was apparently a turning point, for after that McDonald met with Saunders and Levine in early November and talked of engineering a confrontation."[7]

On December 12, 1967, Saunders, Levine, and Armstrong met secretly in Denver with McDonald and Hynek. According to Saunders's book, "McDonald's chief interest was the publication of a newsletter which might later grow into a scientific journal. Hynek wanted to create a visible group of qualified individuals who took the UFO problem seriously, so that in the event of a Congressional hearing, there would exist an organization to which the Congress could turn."[8]

According to Saunders's account, "Hynek had had a cold and excused himself from our meeting early. After he left, McDonald brought up Low's controversial 'trick' memo. We were surprised that he knew anything about it. McDonald said that [NICAP's] Keyhoe had told him about it." Saunders went on to explain that he "had allowed Keyhoe to copy the memo on the day before Thanksgiving and had encouraged him to share the memo with members of NICAP's Board of Directors."

There is reason to question the foregoing Saunders account on at least one score—that he, Levine, and Armstrong were surprised that McDonald knew anything about the Low memo. Recall McCarthy's thesis statement that, at the time the Low memo was discovered, McDonald was covertly communicating with Armstrong and others in the Colorado project.

On December 28, 1967, barely two weeks after the secret meeting in Denver, McDonald wrote a leading French UFOlogist saying that he was "disappointed and disillusioned with Condon." McDonald added that "some confrontation is going to have to be effected. This is difficult to engineer. A number of us are working on that problem."[9] If McDonald wanted a confron-

tation, he need only have flown to Boulder and met with Condon and Low. What McDonald really wanted was to discredit the Colorado effort.

The coming months, as McCarthy wrote in his thesis, brought "the confrontation which McDonald desired. He played the major role in this episode, which turned on the infamous 'Low memo.' "[10]

On January 31, 1968, McDonald wrote a long letter to Low in which he criticized the conduct of the Colorado investigation. In his letter McDonald revealed that he had seen a copy of the Low memo and quoted portions of it verbatim. Interestingly, McDonald did not claim that he had been shocked by the contents of Low's memo, but said he was "rather puzzled by the viewpoints expressed there."[11]

McDonald's letter was buried in a stack of mail waiting for Low on his return trip. Mrs. Armstrong finally brought it to his attention on February 6. The next day, when Condon met with Saunders and Levine and they admitted having given a copy of the memo to McDonald, Condon fired both men. Shortly afterward Mrs. Armstrong resigned.

On February 9, McDonald sent a copy of the Low memo to the president of the National Academy of Sciences, which had agreed to review the Colorado study's final report. Two days later, McDonald also sent a copy of the memo to James Hughes, Office of Naval Research. Hughes was the contract monitor for several atmospheric research contracts the Navy had awarded to McDonald, and McDonald had covertly used these research funds for his UFO investigations and travels, with Hughes's tacit approval.

McDonald explained that he wanted to keep Hughes informed on the UFO scene in expectation of the time when he would formally seek Navy funds for UFO research, rather than bootlegging these activities. Not surprisingly, McDonald warned Hughes not to discuss such "explosive material" in letters sent to his office and that any discussion of these matters should be sent to McDonald's home.[12]

On April 30, 1968, coincident with the publication of Fuller's article in the May 14 issue of *Look* magazine, NICAP held a press conference in Washington to denounce the Low memo and the Colorado investigation. During the question-and-answer period, I asked NICAP director Keyhoe, "What would you do if one of your employees were to go through your files and take certain papers out and send them to me, or to the Air Force, without your knowledge?" Keyhoe replied: "I'd probably fire him. I'd take a dim view of the disloyalty, not the papers."

When Keyhoe sharply criticized Condon for failing to make field investigations of UFO cases, I asked Keyhoe: "How many field investigations have you made in the past year?" Keyhoe replied: "About five and I made a great many by telephone." When I asked him to identify the five cases he investigated, Keyhoe replied: "Three of them I don't care to mention because one of them, one group consists of sightings the Air Force did not report to Condon." I then responded: "Well, could you mention the [other] two you did investigate?" Keyhoe declined to answer.

On the very same day that *Look* hit the stands and NICAP held its press conference, Congressman J. Edward Roush (D.-Ind.) took to the floor of the House to denounce the Colorado investigation. Roush said: "There is a strong indication that the Colorado project will be known as the $500,000 fiasco. At the very least, grave doubts have arisen as to the scientific profundity and objectivity of the Colorado project." Roush urged that the USAF be relieved of its responsibility for investigating UFOs and that the job be turned over to the Congress!

Thanks to McCarthy's thesis, we now know that Roush's speech on the floor was part of McDonald's cleverly orchestrated plan. More than a year before, only several months after the Colorado investigation had begun, McDonald contacted Congressman Roush when he visited Tucson. And on March 3, 1967, McDonald wrote to Roush to "push for Congressional hearings" on UFOs.[13] McDonald continued to write Roush to urge him to hold these hearings. But, in late 1967, Roush replied that, while he too favored Congressional hearings on UFOs, he thought they should be deferred until the Colorado study was completed.

Three months after the *Look* article was published and after Roush had denounced the Colorado effort, he arranged for the House Science and Astronautics Committee (of which he was a member) to hold a one-day "UFO symposium." It was characterized as a symposium rather than a hearing for good reason. Five of the six scientists invited to testify, including McDonald and Hynek, were strongly pro-UFO. The sixth, Carl Sagan, at the time was mildly pro-UFO. (Sagan since has become a UFO-skeptic.)

Thanks to McCarthy's thesis, we now know that Roush allowed McDonald to select the six scientists invited to testify. McDonald used Roush's office as his base of operations and was authorized to use the congressman's telephone credit-card for long-distance calls made outside Roush's office. Roush's very one-sided UFO symposium provided grist for the mill of author John G. Fuller, who promptly produced a paperback book, entitled *Aliens in the Skies: The New UFO Battle of the Scientists,* consisting largely of pro-UFO testimony presented at Roush's symposium. The book provided still another opportunity to browbeat Condon, Low, and the University of Colorado.

In November 1968, Congressman Roush was defeated at the polls. Shortly thereafter he was named to NICAP's board of directors.

The *Look* article, the NICAP press conference, and Congressman Roush's denunciation of the Colorado investigation, together with the publication of the book by Saunders and Harkins, occurred many months before the final report on the Colorado effort was made public, in early 1969.

In one of the several sections of the final report authored by Condon himself, he said he had not been aware of the controversial Low memo until it burst into public view. He noted that Low's memo represented "at most, preliminary 'thinking out loud' about the proposed project by an individual having no authority to make formal decisions."[14]

More important, Condon pointed out that one of Low's key recommendations in his memo, that the investigation focus on the psychology of people who report UFOs rather than investigate the phenomenon itself, was "exactly contrary to the procedure actually followed by the project." Condon added: "It should be evident to anyone perusing this final report, that the emphasis was placed where, in my judgment, it belonged: on the investigation of physical phenomena, rather than psychological or sociological matters."[15]

Condon could have added—but probably was too embarrassed to do so—that, if he and Low had wanted to conspire to create false impressions, then Condon would never have given his several public speeches expressing his strong skepticism about UFOs.

During the two years following publication of the Condon Report, as it is now known, until McDonald's tragic death, McDonald continued to give pro-UFO lectures to scientific groups around the country. I heard, or obtained copies, of many of those talks. *Never once did McDonald raise the issue of the "trick" memo in his talks before scientific groups.* Apparently he realized that Low's memo had served its purpose, to blacken the names of Condon, Low, and the University of Colorado in the public eye, and would carry no weight-of-argument among scientists.

Instead, McDonald chose to criticize the Colorado effort on the grounds that there were a number of UFO cases for which the team was *not* able to find rational, prosaic explanations. The same criticism is voiced today. Yet the fact that there were unexplained UFO cases demonstrates that the Colorado project did not avoid tackling challenging incidents. And the fact that these were published in the Colorado report shows that there was no attempt at coverup or censorship. In other words, contrary to the impression conveyed to large segments of the public by McDonald's well-orchestrated campaign, Condon and Low did not resort to skullduggery.

But what about those unexplained cases? One McDonald found especially impressive involved the crew of a USAF RB-47 electronic reconnaissance aircraft on a night training-mission over the Gulf states. The Colorado team was handicapped in investigating this case because, when the pilot brought the case to the attention of Colorado investigators, he provided an incorrect date and the Colorado investigators were not able to locate original files and reports.

Later, when McDonald managed to locate the original files, I myself tackled this case and found it one of the most challenging I had ever undertaken. It required many hundreds of hours of effort, including locating 20-year-old data on the antenna radiation pattern of an old radar and the schematic diagram for a decade-old electronic intelligence system. After a lot of work, and with a lot of luck, I was able to develop a prosaic explanation that was endorsed both by the RB-47 pilot and by the electronic intelligence (Elint) operator whose equipment was involved.[16]

Another decade-old UFO incident that had occurred in England also went unexplained in the Condon Report. My own lengthy investigation

developed a prosaic explanation.[17] I suspect that the young scientist assigned to this case overlooked potential prosaic explanations because he was too eager to believe that some UFOs were extraterrestrial spaceships.

Still another of the unexplained cases in the Condon Report involved two photos of a UFO that resembled an inverted pie-tin. The young scientist who investigated this case, and who has since become a well-known planetary scientist, was simply too credulous in accepting statements from seemingly honest farm folk. Later, this scientist revised his original view and concluded the photos were a hoax after considering evidence developed by Robert Sheaffer and my analysis.

All three of the unexplained cases in the Condon Report that I investigated proved to have prosaic explanations. I am confident that the others do also.

There are important lessons to be learned from the University of Colorado project. They are especially important if the U.S. government should ever decide to fund a scientific investigation into other claims of the paranormal, such as parapsychology.

If the government did decide to fund an investigation into parapsychology, for instance, who could be expected to volunteer for the effort? The most eager volunteers would be those scientists who already are investigating psi. Most, if not all, of them believe that psi exists or they would not be devoting their careers to the subject. But clearly this disqualifies them as impartial researchers.

What *experienced* scientist would volunteer to even temporarily abandon his or her present career in a field that seems promising for one that seems to be a pseudoscientific dead-end? The bulk of the volunteers for such a project would be young, inexperienced scientists who would hope to become pioneers in a new field with profound implications. These young researchers would be hopeful of discovering evidence early in their careers that could make them famous. And it is this attitude that could make them vulnerable to becoming victims of self-delusion and ambition.

In retrospect, it is clear to me that at least some, if not many, of the young researchers who volunteered for the University of Colorado UFO investigation had what might be called "UFO-stars-in-their-eyes" hopes and ambitions. There is no hard evidence to show that they were as strongly pro-UFO as Saunders and Levine, but considerable circumstantial evidence to suggest that at least several of the young scientists were not as skeptical as they should have been.

Another criticism I would level at the Colorado project is that it undertook to investigate too many old UFO cases. The older the UFO incident, the more difficult it is to obtain the necessary hard data and the more flawed will be the recollections of those who were involved. Yet, if Condon and Low had opted to focus on current UFO cases, their critics would have accused them of ignoring the most impressive data.

If there had been UFO reports *only* during the late 1940s and the 1950s and none thereafter, the Colorado investigators would have had no choice

but to investigate the old incidents. But UFOs were a continuing, ongoing phenomenon, with many hundreds of recent cases and many dozens that occurred while the Colorado investigation was in progress. These current cases could be considered a representative sample of the phenomena, and the Colorado investigators should have focused their principle energies on these incidents. But I acknowledge that this is the wisdom of hindsight.

In summary: Under the difficult circumstances, Condon and Low probably did as good a job as was possible, especially considering that one of the three principal investigators already was at least a quasi-believer before the effort got under way.

One thing is now certain, however. The late Edward Condon, Robert Low, and the good name of the University of Colorado all were victims of a well-orchestrated plot to discredit them—a plot whose outlines would still be unknown but for the tragic death of its principal architect and the efforts of an enterprising Ph.D. candidate.

Condon's own brief comments on the skullduggery that occurred, contained in the final report, are illuminating: "I had some awareness of the passionate controversy that swirled around the subject, contributing added difficulty to the task of making a dispassionate study. . . . Had I known of the extent of the emotional commitment of the UFO believers and the extremes of conduct to which their faith can lead them, I certainly would never have undertaken the study."[19]

Notes

1. *UFOs? Yes!—Where the Condon Committee Went Wrong,* by David R. Saunders and R. Roger Harkins (Signet Books), p. 81.
2. Ibid., p. 92.
3. Ibid., p. 139.
4. Ibid., p. 138.
5. "Politicking and Paradigm Shifting: James E. McDonald and the UFO Case Study," a Ph.D. thesis by Paul McCarthy, University of Hawaii, 1975, p. 137.
6. Saunders and Harkins, p. 134.
7. McCarthy, p. 170a.
8. Saunders and Harkins, p. 179.
9. McCarthy, p. 142.
10. Saunders and Harkins, p. 249.
11. Ibid., p. 249.
12. McCarthy, p. 145.
13. Ibid., p. 177.
14. *Final Report of the Scientific Study of Unidentified Flying Objects* (Bantam), p. 549.
15. Ibid., p. 549.
16. *UFOs Explained,* by Philip J. Klass (Random House), Chapters 19 and 20.
17. Ibid., Chapter 21.
18. Ibid., Chapter 15.
19. *Final Report of the Scientific Study of Unidentified Flying Objects,* p. 548. •

Four Decades of Fringe Literature

The numbers of books on fringe science rose to a peak in the late 1970s and have since been on a decline. Trends after 1945 may be associated with social attitudes and events.

Steven Dutch

ALTHOUGH MOST OBSERVERS of the scientific fringe are well aware that the public appetite for nonsense comes and goes in waves, there has been little documentation of the timing, duration, and levels of fringe waves. This paper presents a survey of trends in book publishing since 1945, based on counts in the *Cumulative Book Index* (hereafter CBI) and *Books in Print* (BIP).

Each of these sources has advantages and disadvantages. The data from CBI are based on counts under subject headings and can therefore be expected to yield a fairly complete listing. However, it may take a year or two for a rise in interest in some topic to be noticed and listed under a separate heading. When a fringe theory gains wide popularity, its subject heading may be subdivided, so that the apparent publishing level might appear lower than the true level. There is a certain element of subjectivity that enters into deciding whether to include a book under a given subject. Some fringe topics, such as theories about catastrophes, are not listed under separate categories. Finally, the CBI includes only books actually published in a given year, so there may be year-to-year fluctuations that have little to do with the public interest level. For example, a large press-run may supply demand for a couple of years, so that even though demand remains high, the next year's count may be lower.

The counts from BIP are based on key title words. This approach means that counts may be incomplete; some of the classics of the fringe, such as

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Worlds in Collision, Incident at Exeter, and *Chariots of the Gods?* will be missed by a search of common fringe title words. There will be a scattering of works with unrelated content, such as a medical treatise on occult traumatic lesions listed under "Occult." There will also be reputable scholarly works and even refutations. The importance of such anomalies is minor. Indeed, it is legitimate to include the refutations because they generally get published only when public interest in a subject is high, and anyway they are all too few in number. A search of title key words does catch the "parasitic" literature that appears after a high level of interest has developed and is therefore a useful indicator of public interest in fringe ideas.

BIP includes all works listed as in print by publishers. A given work may stay in print for some years after its press run. Therefore, the total number of works in BIP is two to three times greater than in CBI. Also, trends found from BIP data tend to be more subdued than those from CBI data, with lower peaks and shallower valleys, because the listings tend to persist for several years and year-to-year fluctuations are smoothed out.

There has been a steep increase in book publication since 1945. To determine the actual level of public appetite for the fringe, the title counts were divided by the total number of listings (determined by the page count and an approximate title count per page) and are presented in the figures as titles per 100,000 listings. Space limitations preclude a more detailed analysis, but I will be happy to send copies of my data to any interested researcher. (Please include a stamped return envelope.)

Ghosties and Ghoulies. . . .

By far the largest category of fringe literature might be termed the "classical occult." (See Figure 1.) Included in this subject area are the key words or subject headings "Astrology," "Atlantis," "Occult," "Psychic," and "Reincarnation." One might object that including "Astrology" skews the results, since it is such a popular subject. However, as the figure shows, the trends for all major themes are quite similar, and each theme tends to make up a roughly constant proportion of the total. It appears that interest in the occult, in astrology, and in psychic topics rose and fell together, with a major peak from the late 1940s to the mid-1950s and a much larger peak in the late 1960s and throughout the 1970s. There does seem to be a tendency for short-term lows in one heading to be offset by peaks in another, as if reader interest fluctuated among the different themes from year to year.

The plunge in publishing after 1981 has been so precipitous that I suspected it was the result of a change in classification, but a check of related subjects indicated that the drop is real.

The category of "Atlantis" is problematical. In earlier times Atlantis was part of the occult and was the source of occult knowledge for groups like Theosophists. More recently, Atlantis seems to have been more akin to UFO literature and especially Bermuda Triangle lore. It forms such a small part of

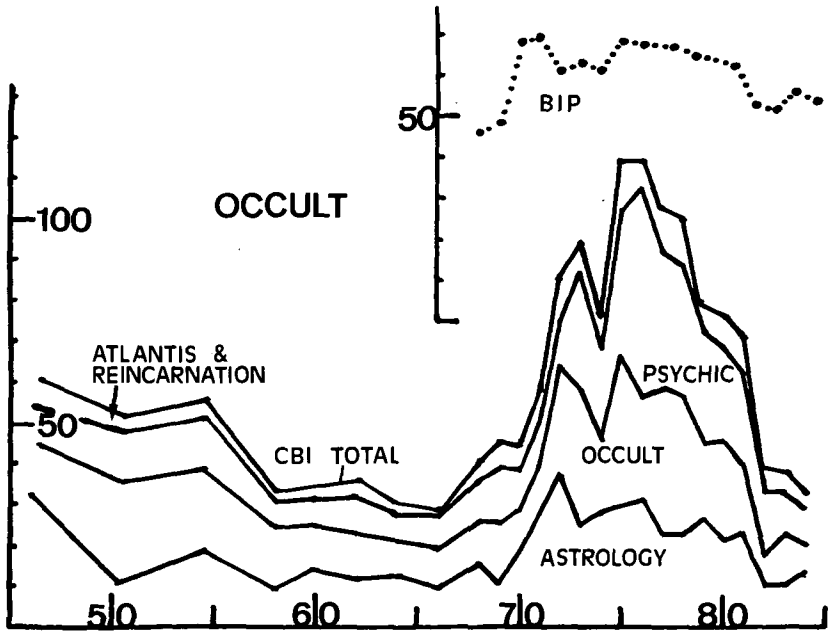

FIGURE 1

the total occult literature that it has no effect on the overall picture.

. . . And Long-leggedy Beasties . . .

Another category is "Monsters." (See Figure 2.) Entries searched in this area included "Bigfoot," "Loch Ness Monster," and "Sasquatch." The CBI was also searched for "Abominable Snowman" before 1970. The publishing record before 1970 was so sporadic as to be essentially nonexistent. During the 1970s, interest in what has been called "cryptozoology" rose to a peak and then showed a definite decline. This fashion seems to have definitely passed, at least for the time being.

Another category that shows a similar pattern is Atlantis–Bermuda Triangle literature. These two apparently different themes actually have a good deal in common, specifically the notion that unknown marvels are to be found in remote parts of the earth. They might collectively be called the "lost world" literature.

. . . And Things That Go Bump in the Night

The archetypical fringe theory is, of course, that of UFOs. (See Figure 3.) The data used in this category included the key words "Flying Saucer," "UFO," and "Unidentified Flying Object," as well as all books by Erich von

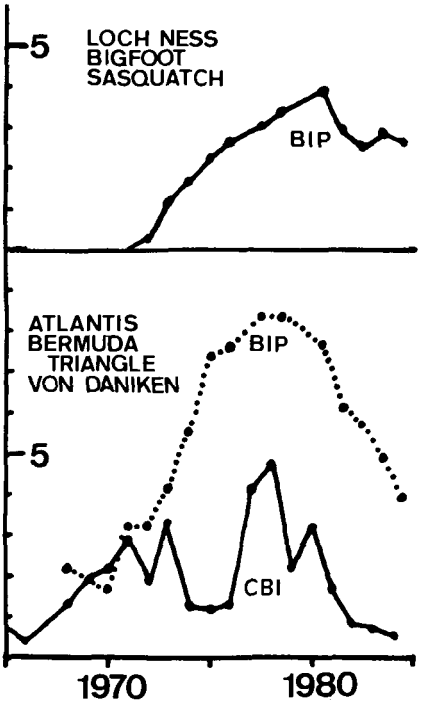

FIGURE 2

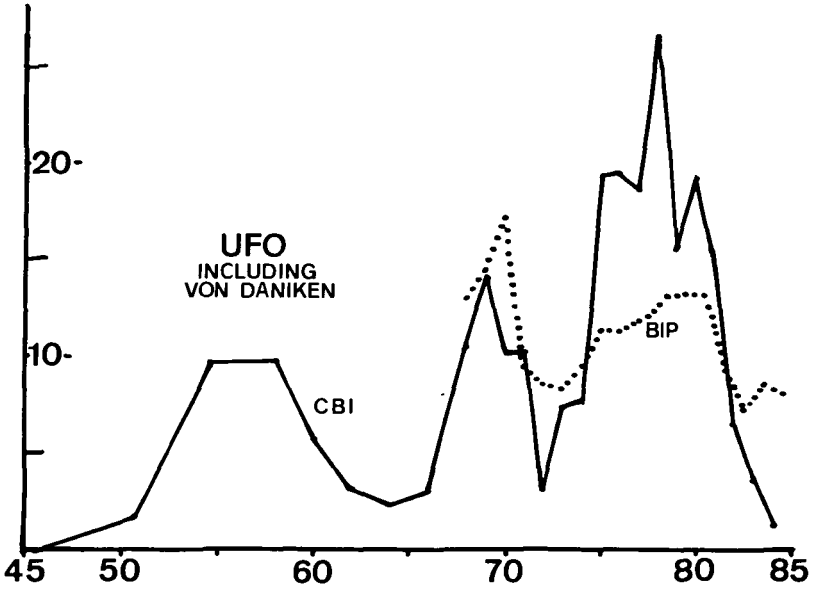

FIGURE 3

Däniken. The pattern is similar to the Occult trends. The great flying-saucer wave of the early 1950s is unmistakable, and a much greater wave in the late 1960s and in the 1970s. In fact, we can recognize two later waves: one in 1967–69, which produced John Fuller's *Incident at Exeter,* and another in 1971–77. Again, note the plunge in publishing after 1981.

Meanwhile, the Ultraconservatives . . .

It is interesting to examine a number of fringe notions that have occupied the ultraconservatives: fluoridation, laetrile, and extreme fundamentalism. (See Figure 4.) The peak period of anti-fluoridation literature ran from 1950 to 1968, but the level of activity came nowhere near equaling the furor over this subject. Clearly, most of the battle over fluoridation was carried on via other media. The few late anti-fluoridation works seem to have had no serious impact.

Laetrile became a *cause célèbre* in the 1970s, when an unlikely coalition from the right and left rallied around it. The peak in publishing is apparent, but as in the case of fluoridation, it is clear that books were not the primary means of information flow.

Two themes common to fundamentalists are also presented: creation/evolution and the devil. In both cases titles were screened and listed only if the intent of the book was obvious from the title or if the book was by an

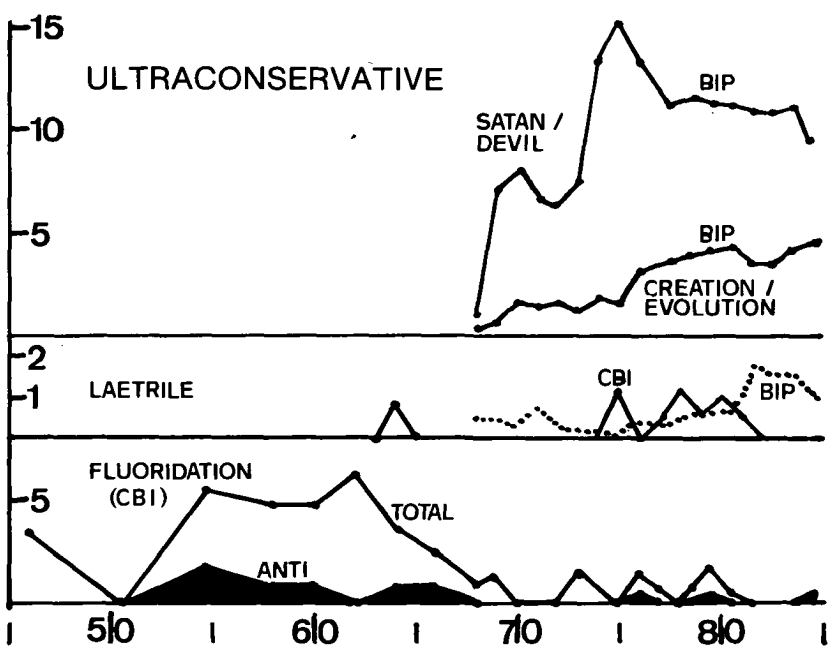

FIGURE 4

author or publisher known to be actively interested in the subject. The steady rise in creationist literature is obvious and needs little comment. The pattern for works with "Devil" or "Satan" in their titles is interesting for its two-stage rise. The first abrupt rise, about 1968, consists largely of occult literature. The second rise, beginning about 1973, is driven largely by fundamentalist works like Hal Lindsey's *Satan Is Alive and Well on Planet Earth.* In fact, a good deal of recent fundamentalist literature is a reaction to the occult wave of 1967 and later.

External Factors

Figure 5 is an attempt to portray fringe literature in a historical context. A few salient works are shown (major debunking works are marked with an asterisk) together with economic indicators and some major historical events. Data for economic trends are from the *Statistical Abstract of the United States.*

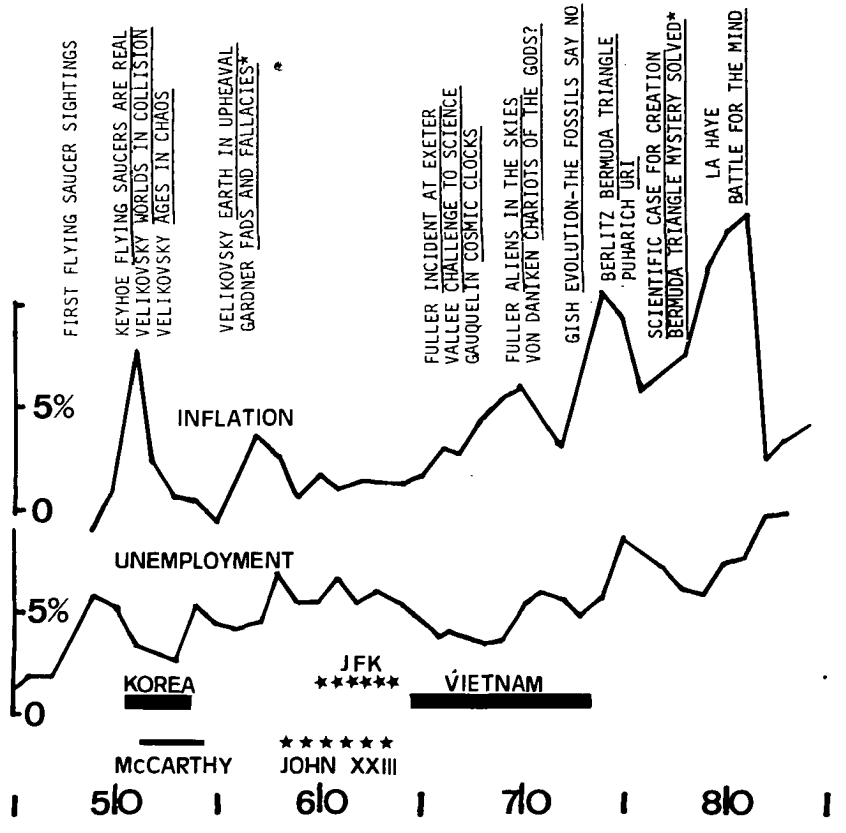

FIGURE 5

It is clear that there is no simple correlation between economic health and fringe publishing. The period of low activity between 1955 and 1967 was marked by stable and generally favorable inflation and unemployment levels, but otherwise a pattern is hard to find. Hard times seem to have little effect on a fringe boom in full swing (mid 1970s) but may be instrumental in ending a boom that is weakening (mid-late 1950s, early 1980s?). One might suspect that people would turn to the occult in times of hardship, but the big occult wave of the 1960s began during a period of sustained economic growth and very low unemployment.

The most obvious correlation is that both fringe booms coincided with a war, but the big flying-saucer binge of the late 1940s began long before the Korean War. A correlation with Vietnam, though, seems almost certain; the Vietnam era was a time of attack on all forms of authority, including scientific authority.

If there is any pattern at all, it seems to me that fringe literature burgeons during times of frustration or uncertain prosperity. During times of optimism, the real world is exciting enough; during very hard times, people are too busy surviving or coping with concrete threats. During the early 1950s, there was the frustration of seeing Soviet influence expand and not being able to counter it. Sputnik, in contrast, was a "threat" that could be met in a concrete fashion, and was. During the late 1960s and the 1970s, there was the frustration of Vietnam (for some, the inability to force a military victory; for others, the inability to influence the political system), civil strife at home, and Watergate. Erratic inflation and unemployment cycles added to the tension by making continued personal prosperity more unpredictable.

What Does It All Mean?

Discussions of values in America have tended recently to focus on the traits of decades. The 1950s have been characterized as complacent, conformist, conservative, and anti-intellectual. The 1960s have been considered activist, liberal, turbulent, socially concerned, open-minded, and intellectually lively. The 1970s have been labeled hedonistic and narcissistic, while the 1980s have been labeled materialistic and individualistic and generally much like the 1950s.

The trends in crank literature suggest that this picture is severely in error. Either trends in fringe publishing bear no relation to the attitudes of society, a rather unlikely assumption, or the simple decade picture is wrong. I think the latter is the case and that two major revisions are in order. The first is that the midpoints rather than the beginnings of decades are more likely to mark major transitions. The second, much more controversial, is that there was no major values-shift between the late 1960s and the 1970s.

For the 1950s, the picture is pretty noncontroversial. World War II perturbed the publishing market in so many ways that we can say little about trends in the mid-1940s, but in the late 1940s and early 1950s it is clear we had a wave of mass irrationalism that included the first flying-saucer sightings

in 1947, the works of Velikovsky in 1950, and the Bridey Murphy mania in 1954. Politically, of course, this interval also saw the McCarthy era. After about 1955, however, the level of all major fringe categories declined and stayed at a low level until about 1965. Then the level of fringe publishing began to climb, peaking in the early 1970s and slowly declining thereafter.

There are many lines of evidence that place the main values shift not in 1960 but about 1965. Most of the positive accomplishments of the 1960s took place early in the decade and were the end result of processes that began in the 1950s. The administration of John F. Kennedy rested on a political power-base built in the 1950s. If the rhetoric of the Sputnik era was at times hysterical, the improvement in public education that came as a result of the shock of Sputnik I was not. The passage of civil-rights legislation was the result of a campaign that began in 1954 with the outlawing of school segregation by the U.S. Supreme Court. Finally, we should note the reforms that accompanied the papacy of John XXIII (1958–63). I am not sure whether these leaders helped create a time of rationality or whether a rational period enabled them to be unusually effective.

On the other hand, most of the traumatic events we associate with the 1960s, except for the assassination of John F. Kennedy in 1963, were concentrated in the latter half of the decade. The Vietnam war became a serious national issue after 1965; most of the campus riots took place in the latter half of the decade as well, as did most of the race riots. Robert Kennedy and Martin Luther King were killed in 1968.

The apparent exception to this pattern is the Apollo program, but even this is not an exception. The space program came under increasingly heavy attack in the late 1960s and was probably sustained only because of the commitments that had been made to it early in the decade, and especially the tendency to invoke John F. Kennedy's pledge to put a man on the moon before 1970. Once the first lunar landings were made, the Apollo program was terminated; in fact, the final three missions were cut from the program.

There is, in addition, good reason to believe that the unattractive values often associated with the 1970s actually were formed in the late 1960s. For example, there is an unmistakable continuity between the political nihilism of the late 1960s ("Down with the system") and the technological nihilism of the early and middle 1970s ("Down with technology—back to nature") as espoused by authors like Jacques Ellul, Lewis Mumford, Theodore Roszak, and Charles Reich. Indeed, many of the leading anti-technologists developed and published their ideas during the late 1960s.

The egoism that has come to be a symbol of the 1970s can also be clearly traced into the 1960s, where the notion was widely espoused that individual conscience took precedence over social and legal norms, and where people who thumbed their noses at the System were often lionized and held up as role models. Few college students escaped reading Thoreau during that epoch! There was no major change in values after 1970; instead the causes that lent legitimacy to this value system lost their immediacy, and the egoism that once

seemed a means to legitimate ends degenerated into unfocused narcissism (or, if one is especially pessimistic, was revealed for what it always was). As a final note, the 1970s have also been labeled hedonistic, but it is almost superfluous to note that sexual liberation and the widespread use of drugs are products not of the 1970s but of the late 1960s.

The late 1960s were unquestionably a time of intellectual vitality. Unfortunately, it appears that the freedom to challenge basic assumptions often was dissipated in anti-intellectualism; an uncritical rejection of assumptions is just as destructive as uncritical acceptance. It is intriguing to note that the long downward slide of SAT scores coincided with the great boom in fringe literature. Apparently intellectual freedom meant, for many people, the freedom not to be intellectual.

The use of terms like "the sixties" has the advantage of providing convenient labels. It also serves certain ideological ends, particularly for those nostalgic for "the sixties" who feel threatened by the current questioning of the values of that period. The term "the sixties" allows the user to bask in the glow of John Kennedy's Camelot and the struggles of Martin Luther King, imbue the radicalism of the late 1960s with the same aura, and simultaneously disavow the narcissism of the 1970s. Similarly, using the label "the fifties" allows the user to tar the entire decade with the brush of McCarthyism.

The data, I argue, present a radically different picture. There was a definite wave of popular hysteria from about 1947 to 1955 as Americans learned to adjust to Cold War tensions; but the interval from 1955 to 1966 was apparently quite rationalistic (or at least not overtly irrational), perhaps more so than any period in recent American history. It was not all pure reason. (This interval saw the anti-fluoridation panic, and the response to Sputnik was well out of proportion to the real threat.) But the output of crank literature was the lowest of any period studied. After 1965, political unrest was paralleled by a boom in crank literature that has only recently begun to abate.

For the present, the data suggest cause for cautious optimism. Most of the indicators of fringe science have fallen off considerably from their 1970s peak. The creationist movement has lost its key court-cases and has apparently retreated to its classical role of agitation within ultra-orthodox religious groups rather than trying to win open equality with science. (This does *not* mean it has ceased to be a threat!) Indeed, a key reason for the failure of creationism has been the reluctance of major evangelists and denominations to risk tying their own credibility to creationism lest the bubble burst. Finally, recent writings of major evangelists abound in warnings about "backsliding," "worldliness," and "becoming lukewarm," a dead giveaway that their pitch has lost some of its appeal.

On the negative side, we have lost much. All that was gained in the interval from 1965 to 1980 could have been gained more easily and rationally. Despite the successful Voyager mission, the full-scale Grand Tour of the solar system proposed in the late 1960s never took place. There was no U.S.

mission to Halley's Comet. The state of science education is a shambles. Although no major educators have said so openly, many of the educational reforms that have been proposed in recent years amount to a return to pre-1965 methods and curricula. Funding for science has been cut and cut again; both by conservatives who opposed such spending on principle and by liberals who see it as diverting funds from social expenditures. The level of crank publishing has fallen sharply, but the backlog of such literature in print is still high; and there is plenty of fringe literature outside the book market. We should also bear in mind that an absence of fringe literature would not necessarily mean an intellectual public. Recall that the early 1960s, a time of low fringe output, was also the time that television was called "The Vast Wasteland." Certainly it appears that many of the people who read *Chariots of the Gods?* a few years ago are watching "Dynasty" rather than PBS; that is, fringe literature has given way not to intellectualism but to nonintellectual escapism.

On a positive note, I suspect the rise of microcomputers may also have played a role in diverting attention from fringe works, first of all by providing intellectually stimulating alternative activity and, second, by enabling millions of people to develop a feeling of technological competence and a sense of participation in science and technology.

It appears we are in a time of transition. I suspect fringe publishing will be relatively dormant for a while, then revive as a new generation of consumers arises. The task confronting us is to make the best possible use of this interval and to be prepared when (not *if*) the next fringe wave arrives. •

The Potent Process of Peer Criticism

Within science, ideas have to prove their mettle. The scientist has to have his ideas accepted by other scientists if he is to make "a contribution to science." This informal but nonetheless potent process of scrutiny and criticism by peers is reinforced nowadays by the existence of formal custodians or assessors. For example, scientific referees who judge the results of research before publication in scientific journals, and granting committees who evaluate applications for funds to support new and continuing research projects. The system operates primarily to decide what is to be accepted as a likely contribution to the advancement of science; a largely unintended consequence is that it operates also to determine what is scientific and what is pseudoscientific.

—J. W. Grove, "Rationality at Risk: Science against Pseudoscience," *Minerva* (Summer 1985)

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Some Remote-Viewing Recollections

Adventures in the land of SRI

Elliot H. Weinberg

A RECENT COLUMN by Jack Anderson suggested that the Soviet Union is well ahead of the United States in exploiting paranormal ability, but cited a U.S. effort called "Project Grill Flame" and practitioners like the late former Police Commissioner Pat Price to show that the United States may not be so terribly far behind in this arcane but important field.

And, of course, Anderson is right in saying that achievement here would be critical. Nothing could be more significant for our own national security, and potentially more threatening to the enemy's, than a well-developed capability for remote viewing. It is hardly necessary to expand on the advantages one would have at the bargaining table if all the fall-back positions were already known. It would be neat indeed to be able to follow our Kremlin counterparts as they wander around doing their bureaucratic bits for communism or to be able to read page 72 of a 200-page report in the KGB's file of "eyes only" documents buried deep within some subterranean vault. As many a bridge player has observed, "One peek is worth two finesses." Indeed, some poker players have been immortalized for developing an almost infinite variety of ways of reading the other fellow's cards. (You can find acknowledgment of some of their better-known achievements inscribed on stone markers in Tombstone, Arizona, for instance.) Next to anti-gravity devices, which already have foundations busily at work, and perpetual-motion machines of which we always have a plethora of good blueprints lying around, I suppose a proclivity for remote viewing *would* be a high-priority item. If the United States or the Soviet Union, or for that matter, Harrah's, wants to invest in

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this kind of research, who would blame them? Nonetheless, keeping an open mind shouldn't be synonymous with keeping one that's just plain empty. In the hope that my own past explorations can provide useful data for experts in the field and in the spirit so carefully nurtured by Professor Hansel (*ESP and Parapsychology: A Critical Re-evaluation,*), I recount the following adventures.

About twelve years ago, during a period when I had some governmental responsibility for keeping track of research trends and for recommending funding priorities, I was asked to review the field of paranormal research, particularly what was coming to be known as "remote viewing." As one does with any other field, I read what literature I could find, determined who some of the principal researchers were, and arranged to visit them.

One pair of names was cited so often that I arranged first to visit the Stanford Research Institute (SRI) laboratory of Russ Targ and Hal Puthoff in California. As accurately as possible I will attempt here to report on events that occurred during the several meetings that eventually took place. We first met over lunch, during which Puthoff emphasized his and Targ's perspective that remote viewing and other paranormal talents are really quite common in humans, but rather latent and underutilized by most. He argued that these kinds of abilities are discouraged from early childhood and hence are never allowed to develop in the way that athletics and artistic talents are.

As it turned out, lunch provided an excellent backdrop for the events of that day and others. For openers, Pat Price, a "psychic" subject in some of SRI's remote-viewing experiments, claimed to be able to read the numbers on Soviet submarines currently in port in, say, Sebastopol. I felt unable to test that thesis, but offered him the opportunity to read off the numbers on a dollar bill still in my wallet. It seemed apparent that, if any aspect of optical science was involved, the odds of succeeding in this latter task would be immensely better than in the more remote one. He stated unequivocally that he certainly could; however, he wasn't in the mood to do so at the moment. Readers who have followed the saga of Price's exploits know that during his lifetime his advice had reportedly been sought out by many federal, state, and local agencies concerned with problems ranging from national security to the apprehension of wanted felons. Hal Puthoff remarked later to me that Pat "may sometimes overstate his powers."

This "aura" of reasonableness about almost everything Targ and, especially, Puthoff had to say about their findings has been remarked upon by others. When conflicting events or explanations arose, Hal was generally comfortable with a disclaimer that the area needed more work or that perhaps there were inconsistencies that needed to be ironed out. For him and his associates, however, there was never any doubt that the central theme—the existence of paranormal behavior of various kinds—had long since been established beyond question. It was simply a matter of more research to delineate the full power, and limitations, of these skills.

Few would dispute that science, traditionally, has made its great leaps

forward in much the same way. First, one needs to be convinced of a thesis, and then one finds the evidence to support one's case. Sometimes—as in the case of Isaac Newton's measuring sound velocity along the corridors of Cambridge University—if the data don't exactly come out right you "adjust" them a little knowing that the theory is right. (Physicists familiar with the Newton story will recall that later, when the correct adiabatic rather than isothermal specific heats were employed, the theory and the data coincided beautifully.) Still, in assessing a new and unfamiliar area, one must always keep in mind that anticipation of a particular result has been known to bias the experimental data reported.

In pursuit of his theme that each of us has some paranormal ability, Puthoff insisted that I try to visualize his laboratory, which I had never seen, and to tell him what I saw. Over a second cup of coffee, I was urged at least to pick a color that came to mind. One does try to accommodate; I announced that red occurred to me. Of course, we all know that red is most commonly chosen when people are asked for such a choice—and I had deliberately selected it for its known popularity.

With barely a moment's hesitation, Hal informed me that I had passed stage one of the learning procedure. In a few moments we would be going into his laboratory, which, he assured me, was not at all unusual except for one thing: The floor was covered by a very red rug! In his mind, I could now be added to the legion of earlier statistics proving that people do possess these powers and, when pressed, can display them.

Next, on to the laboratory, where I would be given a chance to see the equipment and the data and to discuss in some detail the various procedures used to assure objectivity in the results obtained and in their interpretation.

Upon entering, I saw several things that were sufficiently remarkable to have come to mind earlier if I truly had a talent for remote viewing. One item struck me as most unusual, even exotic. It was an ESP machine, constructed in such a way that experimenters could predict a sequence of numbers while simultaneously the machine ran off a random series. Data collected in this way was used to identify individuals with abilities to forecast the outcome of random events like the tossing of dice or the drawing of cards. (This program has been described elsewhere, and it is not my intent to review it here.)

But the rug! Upon first entering the room Hal immediately and triumphantly called my attention to it and reminded me of my lunchtime exercise in remote viewing. Sad to say, although I tried as hard as I could, I could not associate red with an observable color in that rug. Indeed, it was entirely nondescript, as I dimly recall it now, with a slightly tawny or brownish tinge that one associates with rugs designed to minimize the effect of shoes with dirt and sand embedded in their soles. It may have been a priceless Persian, for all I know, but it was not red! Not even slightly.

In a way—more serious and important than I realized at the time—this experience provided me, at least, with insight into demonstrations that I, and others, would be involved with at one time or another. To question for a

moment that Hal Puthoff entertained any doubts that the most striking feature of the room was truly its "red" rug would be fatuous. Once I had pronounced the word "red" at lunch, his mind had sought—and found—what I must have been "seeing."

Although we had many interactions over the following several years, I took only one serious personal stab at remote viewing with Puthoff. It was a spontaneous thing. The opportunity occurred because I had some time to kill after visiting him and before my next appointment. He asked if I would be willing to sit in his office while he went to a remote site. Fifteen minutes after his departure I was to try to visualize his location and to write as complete a description as possible of his surroundings. He would then return; we would go to the site together and see how successful the experiment had been. This procedure has been elaborately described and reported elsewhere. The purpose of this account is to "flesh out" the official versions with one participant's "hands on" experience.

I won't mislead the reader by saying that I tried to do what was asked. My friends know that I have such a poor sense of direction that even finding my way home on a daily basis can prove a challenge. No, I was not motivated to mentally try to follow his path and to report the passing scene. Instead, I waited the appropriate time allowed for him to get wherever he was going and then wrote down a rather careful description of the gardens and beautiful hanging baskets that made up a part of the landscape around the Stanford University hospital, where I had visited a researcher (on another topic, needless to say) the previous day. I included considerable detail about the colors of the flowers, but avoided any descriptions that would uniquely identify the hospital locale.

Upon his return, Hal asked to see what I had written, and then we went in his car to the spot he had chosen to occupy during the time I was writing my description. For this exercise, he had elected to park his car near the Stanford railroad station and then walk to the tunnel, or underpass. As we walked into the underpass together, I was struck by the almost total lack of any objects that could be correlated with my colorful description that was now in Hal's hands. It was quite dark; gray concrete walls and ceiling and similarly drab pavement were all that one could see. Occasional passing cars added some flashes of light and color. (In later years I was to wonder: If I had reported drawing a complete blank, would I then have been congratulated on my accuracy in remote viewing?)

The whole affair seemed to puzzle my companion for a few moments. He remarked that he could find little to correlate between my written report and what we could see *in situ.* At this point, prognosis for a successful outcome seemed dim. Few would believe that any judge, asked to station himself in the underpass with my description of the gorgeous hanging baskets of flowers, would find a high degree of correlation.

But, wait! Puthoff now recalled that while he had been in the underpass on the earlier occasion he had wanted to know the correct time, since I was

presumably going to be describing his whereabouts in synchrony. He further reported that he had happened to leave his watch at home that day so he had been forced to "surface" and walk to his car in order to read the time on its dashboard clock. This event necessarily occurred at the time I was doing my "viewing" from his office. Therefore, at his urging we retraced his steps up and out onto the overpass, whence a broad 360-degree vista lay open to the observer.

At Hal's encouragement, we both scanned the landscape in all directions, looking for any possible "match" to my portrayal of the scene. It was at this moment that I reached my "Nirvana." It suddenly came to me that possibly, just possibly, many remote-viewing research reports could, simultaneously, be neither evidence of a paranormal ability nor a deliberate hoax on the part of the researchers.

Readers who have followed remote-viewing projects know that a principal test for validity is, at a later time, to send "judges" to various preselected sites with a number of coded written descriptions in hand to see how well they can match the sites to the written material. The merit in these studies has appeared to lie in their statistical analysis. One counted the coincidences that occurred when independent judges were sent to a number of locales and required to find the best match to the written descriptions previously provided. While standing on the overpass with Hal, the following remarkable thought occurred to me, which ever after allowed me to remain at peace with myself over these well-publicized experiments by scientists of good repute.

The thought went like this. If one does establish a number of sites to be visited, how do you tell someone unfamiliar with the area how to get there? Naturally, you don't just say, "Go to the vicinity of Hoover Tower on the Stanford campus." That takes in too much territory. How is the process going to work if you want to arrange for visiting judges, unfamiliar with the area, to inspect your viewing sites? For example, suppose Hal Puthoff is faced with my write-up for the site known as "underpass." He has gone out there himself and felt puzzled. He has the task, let's say, of describing the exact location so that a newcomer who is to serve as a "judge" will arrive, by himself, at the right place and then review the written characteristics for similarity. Let us say at the outset that Puthoff has not even the slightest intention of altering one written word. He is too much of a scientist to do that. Yet, he *knows* the system works.

What does a person do in this situation? He does just what Hal did to me. He "looks around" to determine the exact vantage point, or at least the most favorable one, from which the description can best be called a "match." If this means deciding that the observer must have been on the top of the overpass rather than under it, even for only a moment, he merely needs to add guidance for future judges visiting the site to approach the overpass by first going up and over it.

In a similar vein, given a remote viewer's description of a site and trodding over the area personally at a later time, *knowing* that there must be some

agreement between the description and the reality, Hal's job is merely to look around for the approach and orientation most nearly matching. These instructions can then be incorporated into the exact site description, so that a judge can later be sent to the area.

Now if, let's say, a fountain is described in the written material at the site known as Hoover Tower, one merely wanders around the rather large campus area surrounding the tower until a fountain is spotted. That *must* be the spot the remote viewer was observing from and, quite naturally, appropriate directions will be provided to assure that the judge approaches "correctly" in the future. Let me point out that this procedure, while seeming to be conveniently selected for the purpose, may be about the only way to go anyhow. You would have to be a good bit more specific about a site's locale and orientation for a visiting judge; and it's almost reasonable to let the remote viewer's description guide you, to be sure your judge will be looking from the same vantage-point.

Statisticians can have a field day developing the details, but few would doubt that this initial biasing of the approach to the exact spot to be used by the judges would enormously ease the burden of finding "something" to tie the location and the written description together. After all, for the results to be promising we don't need a "hit" every time. We just need to get above the level of pure chance.

In summary, a mechanism has been presented by which unretouched written descriptions prepared by "remote viewers" can be paired off with a high degree of accuracy with precisely described locales, previously selected, without requiring any conscious effort to influence the results or any violation of accepted physical laws.

I cannot say whether this method is, or has ever been, used at SRI in the experiments they have reported; it seems highly likely, however. At least it appears as likely as any other explanations I have heard in which fraud was ruled out *ab initio*.

As a footnote let me add that, at the time of the underpass test, Puthoff told me that as a remote viewer I had scored only "fair," considering what I had written and what we could see. However, from later correspondence I understand that he remembered me as a failure (perhaps the only one he had come across?). I ascribe the difference in these two versions to his desire at the time to limit my embarrassment at performing so badly. •

Book Reviews

On Banalities, Puffery, and Untruths

Examining Holistic Medicine. Edited by Douglas Stalker and Clark Glymour. Prometheus Books, Buffalo, N.Y., 1985, 406 pp. $21.95, cloth.

Wallace I. Sampson

EXAMINING HOLISTIC MEDICINE is a gem of a book I wish had been written ten years ago. The small crew of skeptics who for the past decade or more have been trying to neutralize the more pernicious aspects of the holistic movement have been throwing darts at individual holistic balloons. What we have needed is a strategist or two to shut off the hot air at the source and expose the basic folly of holistic philosophy. Douglas Stalker and Clark Glymour, two professors of philosophy and the editors of this volume, did just that in their article in the *New England Journal of Medicine* in 1983. The nucleus of this book and its first chapter are that article. In it, they take the whole matter by the horns, so to speak, and take the movement's tenets, critiques of "traditional" medicine, and claims for what they are—a series of banalities, improper analogies, puffery, and untruths. I have never read a more devastating critique of the holistic movement.

Before reviewing the substance of this book, let me make the following observations. "Holistic medicine" is no longer synonymous with a humanistic, humane, personal, kindly, understanding approach to the practice of medicine. Neither is it a physician's consideration of the psychological, religious, cultural, and spiritual state of the person (patient) along with the entire "ecological" milieu. That to me has always been the proper practice of medicine. Insofar as we physicians and our institutions have failed to fulfill some people's expectations of that practice so proportionately should we accept the criticism.

But the "holistic medicine" movement of the 1970s and the 1980s has not been an attempt to correct the deviation of the course of medicine away from "medical center" practice to the more personal. The movement has been a crass intrusion into the ethical and professional practice of medicine by all manner of cranks, quacks,

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charlatans, tarnished pseudoscientists, deluded personalities, polemicists, opportunists, and just plain poor-quality doctors and chiropractors who were not making it. They saw an opportunity to take advantage of a societal disaffection, and moved swiftly.

Stalker and Glymour, in their opening chapter, keep the going light—"Holistic dentists . . . promise to take account of the spiritual factors affecting their patients' teeth." And, in the fashion of philosophers, they clarify the most obscure rhetoric of the holists in everyday terms and bring it down to earth, where the mystery disappears and the pure nonsense of it all is exposed.

The rest of the book has chapters by other authors on the philosophy, methodology, and some of the individual practices of the movement. James C. Whorton reviews the origins of holism in the nineteenth century. He uses homeopathy as an example of the thought of the times and gives a number of historical vignettes. For example, the term *allopathic* was coined by homeopathy's founder, Samuel Hahnemann, to describe modern medicine, implying that all the rest of medicine was "just another 'pathy,' no better and no worse than competitors." Similar tactics are used by modern holists to disparage medicine. Susan M. Williams, R.N., completes the first part of the book with a less cutting, but still disapproving, analysis of holistic nursing education and practices.

Part 2 starts with an analysis by Austen Clark of the holistic theories of the influence of psychological states on the origin of disease. He also helps to simplify and clarify this most difficult area of claims. One of his most cogent points is one I have not heard often in argument: "That psychological factors are causal [in disease] does not imply that they are curative. Once a pathological process is established [peptic ulcer] there may be no psychological mechanism for its cure." This simple truth should help brake the recent slide into meditation and imagery techniques—if only logic and truth would win. Most of the chapter explores the difficulty of establishing causality in the first place and is must reading for anyone dealing with holistic claims. Kenneth Pelletier, the darling of holistic psychology, comes off very badly here, as well he should.

Then Stalker and Glymour, in their "Quantum Medicine" chapter, stride fearlessly into the most vexing thicket of holistic thought: the relation between quantum mechanics and consciousness and healing. The subject is a difficult one to understand in nonmathematical terms, but the authors make the problems and the solutions understandable by again reducing the controversies to their most fundamental terms and showing that the questions posed by the holists are essentially meaningless and not deserving of direct response. The most helpful principle is that strange quantum phenomena occur at the quantum level. At our ultramacroscopic level of functioning, where the probabilities of things happening according to Newtonian physical laws are so great, we don't have to worry about Heisenberg's uncertainty relationships or Schroedinger's equations. For lay students of these problems, this chapter, along with Heinz Pagel's *The Cosmic Code,* is a must.

I found Robert N. Brandon's chapter, "Holism in Philosophy of Biology," also rich in critical ideas. He reminds us that the operating principle of biological investigation and philosophy is mechanistic, not "reductionist," and that the major advances in biologic and evolutionary thought occurred without preoccupation by holism, thank you. That is most comforting to know, and why didn't I think of that? He uses as one example the mapping of Drosophila chromosomes and the discovery of the linear sequence of genes by T. H. Morgan. But can you think of any major advance in biology that has come from holist speculation? I couldn't either.

Daniel Wikler took on the subject of personal responsibility for health. It is a milder critique than most of the other chapters, but then who can argue with the concept? The argument comes when it is claimed that we have more control over our behavior and our fate than we really do. Wikler explores this dilemma with an even-handed, sometimes dialectic style.

The two chapters of Part 3 examine holistic methods. Daisie and Michael Radner's work is valuable for helping to classify the thinking and argument errors used by the holists. They concentrate on four types. The first is anachronistic—the taking of ancient methods of treatment and plunking them down in the twentieth century without even a proof or an apology. Argument from spurious similarity is "an attempt to gain scientific status for a theory on the grounds of its alleged likeness to a recognized scientific theory." The grab-bag approach to evidence is the use of anecdote and the selection of confirmatory evidence. Refusal to correct in light of valid criticism is, of course, the hallmark of all quackery. More detail and examples are available in the Radners' *Science and Unreason,* but there is enough in this chapter to give the flavor and satisfaction of this type of analysis.

Thomas C. Chalmers comments on scientific quality by looking at the *Journal of Holistic Medicine.* It is a short piece that says what has to be said about the quality of that journal. Of 42 successive articles, only two dealt with controlled trials. The rest were apparently philosophical ramblings, political diatribes, and poorly designed studies.

The final half of the book, Part 4, contains excellent expositions of various practices commonly described as quackery or pseudoscience but which have enjoyed a renaissance during the holistic boom. There are some very gratifying analyses in tune with the themes set in the first half. All of the critiques are hard-hitting, with little of the weasel-wording and fence-straddling commonly seen in newspaper and magazine articles. The authors of the chapters are quite familiar with the practices they discuss, and the names of some are familiar to readers of the SKEPTICAL INQUIRER. Iridology is examined by Russell Worrall; acupuncture, by Petr Skrabanek; and chiropractic, by Edmund Crelin. There is also a timeless piece on homeopathy by Oliver Wendell Holmes, Sr., M.D., which except for the florid language of the last century could have been written yesterday.

Part 4 also includes chapters on holistic psychotherapies, Simonton visual imagery for cancer, and therapeutic touch. These three and biofeedback (the last chapter) are difficult subjects to analyze because there is so little good work published by their proponents. Yet these methods are at the core of the holistic movement. They are relatively new, and their practices are often performed by licensed health and medical practitioners. They include in their theories and practice most of the holistic principles of self-care and freedom from medication and surgery. Yet it is highly unlikely that they are significantly effective for any but the mildest and most functional of disorders. It is likely that any effects, except for those of biofeedback, are placebo in nature. (No one knows for certain just what biofeedback is or does.) The authors, Edward Erwin, Edward Friedlander, Philip and Mary Jo Clark, and Larry D. Young, analyze them well.

Vitamin C for cancer gets its due in the two now classic papers from the Mayo Clinic by Edward Creagan and Charles Moertel showing that vitamin C is ineffective. The subject is spiced by the inclusion of an exchange between Linus Pauling and the authors in letters to the editor of the *New England Journal of Medicine.* A chapter on the hazards of herbs, by Varro Tyler, is technical but necessarily so. It is a compact reference complementing his own book on the subject.

The whole subject of vitamin C and its misuse could have been explored at greater length, but the book had to stop somewhere. In its present form, it is comfortably digestible in several sessions of reading. This book is a must for every skeptic's bookshelf and should be in every physician's office for use in answering questions from patients. I would of course also recommend it to the practitioners and customers of holistic medicine. •

Zeroing in on Zombiism

The Serpent and the Rainbow. By Wade Davis. Simon & Schuster, New York, 1985. 297 pp. $17.95.

Gordon Stein

THE IDEA OF zombies—the so-called walking dead—is something most skeptics would view with a jaundiced eye. The problem is not so much with the concept that people can walk around in a stupor but rather with the idea that the dead can be reanimated. Of course, although possible, the probability of such a phenomenon is so small (if the rest of science is correct) that we may virtually say it is zero. However, there are many reports by sober individuals of actual zombies in Haiti. What is one to make of this?

One of the primary rules of paranormal investigation should be that, although the *explanation* given for a particular phenomenon may be totally incorrect (e.g., that UFOs are vehicles from other planets), the *observations* themselves may be quite accurate. That is, those people who say they have seen UFOs or zombies may have actually seen something, but they did not see what they explained the phenomenon to be. In *The Serpent and the Rainbow,* Wade Davis gives yet another example of the truth of this maxim.

While doing graduate work in ethnobotany at Harvard, Davis was a student of Richard Schultes, perhaps the world's leading authority on psychoactive plants. The idea of investigating the truth or falsity of the existence of zombies was suggested to Davis by Nathan Kline, the well-known investigator of drugs used in psychiatry. The idea was that, *if* zombies were really only living people kept in a state of stupor by the effect of some drug, then the identification of that drug would provide a useful agent for surgical anesthesia in the developed world. With this in mind, Davis went to Haiti. Once there, he found that the job was not going to be easy.

Dr. Kline had given Davis the names of a few important contacts in Haiti. One was a voodoo practitioner who sold Davis a vial of powder supposedly used to turn people into zombies. Davis watched the practitioner prepare the powder and, noting the ingredients being used, suspected that the substance would turn out, as it did, to be inactive. Although he had come to Haiti with the idea that the datura plant could be found there (as it can be in the parts of Africa from which Haitians originally

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came), he had some difficulty in actually finding it. These plants are known to be able to induce stupor in humans. He also thought that the calabar plant might provide an antidote to the datura, but no such plants were found in Haiti.

A psychiatrist, another of Davis's Haitian contacts, pointed out that Article 249 of the Haitian penal code makes it a felony to administer any drug to a person that would make that person appear to be dead. If such a drug is given and the recipient is actually buried, the charge is murder, whether or not the person actually dies. With this additional indication that some sort of drug was involved in producing what people have called "zombies," Davis continued his search.

After interviewing a man who was widely regarded as having once been a zombie, Davis decided that the process by which he had been transformed required certain steps and ceremonies and that these could be traced. By a clever series of maneuvers, Davis won the trust of the voodoo practitioner and was finally shown the preparation of the real zombie drug, which he was allowed to take back to the United States.

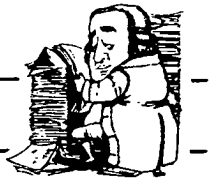
When he returned to Harvard, Davis used the powder obtained in Haiti on lab animals, and what do you know? It produced all the symptoms—paralysis and anesthesia but with full mental alertness—that some people have reported made their relatives think they were dead. The animals recovered from these effects after several days. This is also what zombies report, namely, that they are removed from their graves (after having been alert but totally paralyzed) within two or three days.

Analysis of the ingredients of the preparation was somewhat simplified by the fact that Davis watched as it was prepared and brought back a sample of each plant or animal used. Botanists and zoologists at Harvard readily identified each species and found that many contained previously known powerful pharmacological agents. In fact, there is quite a literature on some of the drugs involved. Davis later returned to Haiti and confirmed the ingredients in the zombie powder. He also confirmed the composition of the salve used to wake up the zombie when he or she is removed from the grave.

Much of the rest of the book is concerned with an examination of the social and psychological context of zombiism in Haiti. Without this understanding, one cannot see why the zombie, once awakened, does not simply run away.

The book is well written and totally fascinating. It should reassure skeptics that success can come from a rational examination of so-called paranormal phenomena and, at the same time, caution them not to dismiss reports of such phenomena out of hand. There may well be a rational explanation of even the most impossible-sounding stories. •

Articles of Note



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Marks, David. "Investigating the Paranormal." *Nature,* 320:119-124 (March 13, 1986). Strong critical review. See News and Comment, this issue.

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"The Mercury Scare." *Consumer Reports,* March 1986, pp. 150-152. "If a dentist wants to remove your fillings because they contain mercury," concludes this good investigative report, "watch your wallet." With sidebar, "Meet the Anti-Amalgamists."

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mal. Many examples. Criticizes the *Columbus Dispatch*'s role in promulgating the Columbus poltergeist claim. Attempt at balanced article also has some criticism of CSICOP.

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—*Kendrick Frazier*

Correction

We regret the printer's omission of the first line of the paragraph beginning at the bottom of page 264 in our Spring 1986 issue, in Tom McIver's "Ancient Tales and Space-Age Myths of Creationist Evangelism." The first sentence of this paragraph should read: The probability arguments are now featured in almost all creation-science books and presentations but are expanded on most fully in James Coppedge's *Evolution: Possible or Impossible?* (1973), a book about "Molecular Biology and the Laws of Chance."

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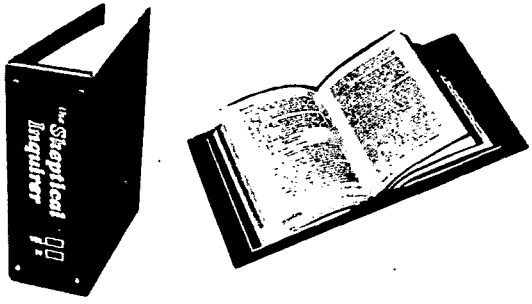

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Partial Contents of Past Issues

SPRING 1986 (vol. 10, no. 3): The perennial fringe, *Isaac Asimov.* The uses of credulity, *L. Sprague de Camp.* Night walkers and mystery mongers, *Carl Sagan.* CSICOP after ten years, *Paul Kurtz.* Crash of the crashed-saucers claim, *Philip J. Klass.* A study of the Kirlian effect, *Arleen J. Watkins and William S. Bickel.* Ancient tales and space-age myths of creationist evangelism, *Tom McIver.* Modern creationism's debt to George McCready Price, *Martin Gardner.*

WINTER 1985-86 (vol. 10, no. 2): The moon was full and nothing happened, *I. W. Kelly, James Rotton, and Roger Culver.* Psychic studies: the Soviet dilemma, *Martin Ebon.* The psychopathology of fringe medicine, *Karl Sabbagh.* Computers and rational thought, *Ray Spangenburg and Diane Moser.* Psi researchers' inattention to conjuring, *Martin Gardner.*

FALL 1985 (vol. 10, no. 1): Investigations of firewalking, *Bernard Leikind and William McCarthy.* Firewalking: reality or illusion, *Michael Dennett.* Myth of alpha consciousness, *Barry Beyerstein.* Spirit-rapping unmasked, *Vern Bullough.* The Saguaro incident, *Lee Taylor, Jr., and Michael Dennett.* The great stone face and other nonmysteries, *Martin Gardner.*

SUMMER 1985 (vol. 9, no. 4): Guardian astrology study, *G. A. Dean, I. W. Kelly, J. Rotton, and D. H. Saklofske.* Astrology and the commodity market, *James Rotton.* The hundredth monkey phenomenon, *Ron Amundson.* Responsibilities of the media, *Paul Kurtz.* 'Lucy' out of context, *Leon H. Albert.* Welcome to the debunking club, *Martin Gardner.*

SPRING 1985 (vol. 9, no. 3): Columbus poltergeist: I, *James Randi.* Moon and murder in Cleveland, *N. Sanduleak.* Image of Guadalupe, *Joe Nickell and John Fischer.* Radar UFOs, *Philip J. Klass.* Phrenology, *Robert W. McCoy.* Deception by patients, *Loren Pankratz.* Communication in nature, *Aydin Orstan.* Relevance of belief systems, *Martin Gardner.*

WINTER 1984-85 (vol. 9, no. 2): The muddled 'Mind Race,' *Ray Hyman.* Searches for the Loch Ness monster, *Rikki Razdan and Alan Kielar.* Final interview with Milbourne Christopher, *Michael Dennett.* Retest of astrologer John McCall, *Philip Ianna and Charles Tolbert.* 'Mind Race,' *Martin Gardner.*

FALL 1984 (vol. 9, no. 1): Quantum theory and the paranormal, *Steven N. Shore.* What is pseudoscience? *Mario Bunge.* The new philosophy of science and the 'paranormal,' *Stephen Toulmin.* An eye-opening double encounter, *Bruce Martin.* Similarities between identical twins and between unrelated people, *W. Joseph Wyatt et al.* Effectiveness of a reading program on paranormal belief, *Paul J. Woods,* Pseudoscientific beliefs of 6th-grade students, *A. S. Adelman and S. J. Adelman.* Koestler money down the psi-drain, *Martin Gardner.*

SUMMER 1984 (vol. 8, no. 4): Parapsychology's past eight years, *James E. Alcock.* The evidence for ESP, *C. E. M. Hansel.* The great $110,000 dowsing challenge, *James Randi.* Sir Oliver Lodge and the spiritualists, *Steven Hoffmaster.* Misperception, folk belief, and the occult, *John W. Connor.* Psychology and UFOs, *Armando Simón.* Freud and Fliess, *Martin Gardner.*

SPRING 1984 (vol. 8, no. 3): Belief in the paranormal worldwide: Mexico, *Mario Mendez-Acosta;* Netherlands, *Piet Hein Hoebens;* U.K., *Michael Hutchinson;* Australia, *Dick Smith;* Canada, *Henry Gordon;* France, *Michel Rouzé.* Debunking, neutrality, and skepticism in science, *Paul Kurtz.* University course reduces paranormal belief, *Thomas Gray.* The Gribbin effect, *Wolf Roder.* Proving negatives, *Tony Pasquarello.* MacLaine, McTaggart, and McPherson, *Martin Gardner.*

WINTER 1983-84 (vol. 8, no. 2): Sense and nonsense in parapsychology, *Piet Hein Hoebens.* Magicians, scientists, and psychics, *William H. Ganoe and Jack Kirwan.* New dowsing experiment, *Michael Martin.* The effect of TM on weather, *Franklin D. Trumpy.* The haunting of the Ivan Vassilli, *Robert Sheaffer.* Venus and Velikovsky, *Robert Forrest.* Magicians in the psi lab, *Martin Gardner.*

FALL 1983 (vol. 8, no. 1): Creationist pseudoscience, *Robert Schadewald.* Project Alpha: Part 2, *James Randi.* Forecasting radio quality by the planets, *Geoffrey Dean.* Reduction in paranormal belief in college course, *Jerome J. Tobacyk.* Humanistic astrology, *I. W. Kelly and R. W. Krutzen.*

SUMMER 1983 (vol. 7, no. 4): Project Alpha: Part 1, *James Randi.* Goodman's 'American Genesis,' *Kenneth L. Feder.* Battling on the airwaves, *David B. Slavsky.* Rhode Island UFO film, *Eugene Emery, Jr.* Landmark PK hoax, *Martin Gardner.*

SPRING 1983 (vol. 7, no. 3): Iridology, *Russell S. Worrall.* The Nazca drawings revisited, *Joe Nickell.* People's Almanac predictions, *F. K. Donnelly.* Test of numerology, *Joseph G. Dlhopolsky.* Pseudoscience in the name of the university, *Roger J. Lederer and Barry Singer.*

WINTER 1982-83 (vol. 7, no. 2): Palmistry, *Michael Alan Park.* The great SRI die mystery, *Martin Gardner.* The 'monster' tree-trunk of Loch Ness, *Steuart Campbell.* UFOs and the not-so-friendly skies, *Philip J. Klass.* In defense of skepticism, *Arthur S. Reber.*

FALL 1982 (vol. 7, no. 1): The prophecies of Nostradamus, *Charles J. Cazeau.* The prophet of all seasons, *James Randi.* Revival of Nostradamitis, *Piet Hein Hoebens.* Unsolved mysteries and

extraordinary phenomena, *Samual T. Gill.* Clearing the air about psi, *James Randi.* A skotography scam exposed, *James Randi.*

SUMMER 1982 (vol. 6, no. 4): Remote-viewing revisited, *David F. Marks.* Radio disturbances and planetary positions, *Jean Meeus.* Divining in Australia, *Dick Smith.* "Great Lakes Triangle," *Paul Cena.* Skepticism, closed-mindedness, and science fiction, *Dale Beyerstein.* Followup on ESP logic, *Clyde L. Hardin and Robert Morris* and *Sidney Gendin.*

SPRING 1982 (vol. 6, no. 3): The Shroud of Turin, *Marvin M. Mueller.* Shroud image, *Walter McCrone.* Science, the public, and the Shroud, *Steven D. Schafersman.* Zodiac and personality, *Michel Gauquelin.* Followup on quantum PK, *C. E. M. Hansel.*

WINTER 1981-82 (vol. 6, no. 2): On coincidences, *Ruma Falk.* Gerard Croiset: Part 2, *Piet Hein Hoebens.* Scientific creationism, *Robert Schadewald.* "Follow-up" on the "Mars effect," *Dennis Rawlins,* responses by *CSICOP Council* and *George Abell and Paul Kurtz.*

FALL 1981 (vol. 6, no. 1): Gerard Croiset: Part 1, *Piet Hein Hoebens.* Test of perceived horoscope accuracy, *Douglas P. Lackey.* Planetary positions and radio propagation, *Philip A. Ianna and Chaim J. Margolin.* Bermuda Triangle, 1981, *Michael R. Dennett.* Observation of a psychic, *Vonda N. McIntyre.*

SUMMER 1981 (vol. 5, no. 4): Investigation of 'psychics,' *James Randi.* ESP: A conceptual analysis, *Sidney Gendin.* The extroversion-introversion astrological effect, *Ivan W. Kelly and Don H. Saklofske.* Art, science, and paranormalism, *David Habercom.* Profitable nightmare, *Jeff Wells.* A Maltese cross in the Aegean? *Robert W. Loftin.*

SPRING 1981 (vol. 5, no. 3): Hypnosis and UFO abductions, *Philip J. Klass.* Hypnosis not a truth serum, *Ernest R. Hilgard.* H. Schmidt's PK experiments, *C. E. M. Hansel.* Further comments on Schmidt's experiments, *Ray Hyman.* Altantean road, *James Randi.* Deciphering ancient America, *Marshall McKusick.* A sense of the ridiculous, *John A. Lord.*

WINTER 1980-81 (vol. 5, no. 2): Fooling some of the people all of the time, *Barry Singer and Victor Benassi.* Recent developments in perpetual motion, *Robert Schadewald.* National Enquirer astrology study, *Gary Mechler, Cyndi McDaniel, and Steven Mulloy.* Science and the mountain peak, *Isaac Asimov.*

FALL 1980 (vol. 5, no. 1): The Velikovsky affair — articles *by James Oberg, Henry J. Bauer, Kendrick Frazier.* Academia and the occult, *J. Richard Greenwell.* Belief in ESP among psychologists, *V. R. Padgett, V. A. Benassi, and B. F. Singer.* Bigfoot on the loose, *Paul Kurtz.* Parental expectations of miracles, *Robert A. Steiner.* Downfall of a would-be psychic, *D. H. McBurney and J. K. Greenberg.* Parapsychology research, *Jeffrey Mishlove.*

SUMMER 1980 (vol. 4, no. 4): Superstitions, *W. S. Bainbridge and Rodney Stark.* Psychic archaeology, *Kenneth L. Feder.* Voice stress analysis, *Philip J. Klass.* "Follow-up" on the "Mars effect," Evolution vs. creationism, and the Cottrell tests.

SPRING 1980 (vol. 4, no. 3): Belief in ESP, *Scot Morris,* UFO hoax, *David I. Simpson.* Don Juan vs. Piltdown man, *Richard de Mille.* Tiptoeing beyond Darwin, *J. Richard Greenwell.* Conjurors and the psi scene, *James Randi,* "Follow-up" on the Cottrell tests.

WINTER 1979-80 (vol. 4, no. 2): The 'Mars effect' — articles *by Paul Kurtz, Marvin Zelen, and George Abell; Dennis Rawlins; Michel and Françoise Gauquelin.* How I was debunked, *Piet Hein Hoebens.* The metal bending of Professor Taylor, *Martin Gardner.* Science, intuition, and ESP, *Gary Bauslaugh.*

FALL 1979 (vol. 4, no. 1): A test of dowsing, *James Randi.* Science and evolution, *Laurie R. Godfrey.* Television pseudodocumentaries, *William Sims Bainbridge.* New disciples of the paranormal, *Paul Kurtz.* UFO or UAA, *Anthony Standen.* The lost panda, *Hans van Kampen.* Edgar Cayce, *James Randi.*

SUMMER 1979 (vol. 3, no. 4): The moon and the birthrate, *George O. Abell and Bennett Greenspan.* Biorhythm theory, *Terence M. Hines.* "Cold reading" revisited, *James Randi.* Teacher, student, and the paranormal, *Elmer Kral.* Encounter with a sorcerer, *John Sack.*

SPRING 1979 (vol. 3, no. 3): Near-death experiences, *James E. Alcock.* Television tests of Musuaki Kiyota, *Christopher Scott and Michael Hutchinson.* The conversion of J. Allen Hynek, *Philip J. Klass.* Asimov's corollary, *Isaac Asimov.*

WINTER 1978-79 (vol. 3, no. 2): Is parapsychology a science? *Paul Kurtz.* Chariots of the gullible, *W. S. Bainbridge.* The Tunguska event, *James Oberg.* Space travel in Bronze Age China, *David N. Keightley.*

FALL 1978 (vol. 3, no. 1): An empirical test of astrology, *R. W. Bastedo.* Astronauts and UFOs, *James Oberg.* Sleight of tongue, *Ronald A. Schwartz.* The Sirius "mystery," *Ian Ridpath.*

SPRING/SUMMER 1978 (vol. 2, no. 2): Tests of three psychics, *James Randi.* Biorhythms, *W. S. Bainbridge.* Plant perception, *John M. Kmetz.* Anthropology beyond the fringe, *John Cole.* NASA and UFOs, *Philip J. Klass.* A second Einstein ESP letter, *Martin Gardner.*

FALL/WINTER 1977 (vol. 2, no. 1): Von Däniken, *Ronald D. Story,* The Bermuda Triangle, *Larry Kusche.* Pseudoscience at Science Digest, *James E. Oberg and Robert Sheaffer.* Einstein and ESP, *Martin Gardner.* N-rays and UFOs, *Philip J. Klass.* Secrets of the psychics, *Dennis Rawlins.*

SPRING/SUMMER 1977 (vol. 1, no. 2): Uri Geller, *David Marks and Richard Kammann.* Cold reading, *Ray Hyman.* Transcendental Meditation, *Eric Woodrum.* A statistical test of astrology, *John D. McGervey.* Cattle mutilations, *James R. Stewart.*

FALL/WINTER 1976 (vol. 1, no. 1): Dianetics, *Roy Wallis,* Psychics and clairvoyance, *Gary Alan Fine.* "Objections to Astrolgy," *Ron Westrum.* Astronomers and astrophysicists as astrology critics, *Paul Kurtz and Lee Nisbet.* Biorhythms and sports, *A. James Fix.* Von Däniken's chariots, *John T. Omohundro.*

Follow-up

Home's Self-Levitations

MARTIN GARDNER gives such a distorted account of D. D. Home's self-levitations (Winter 1985–86) that, with your permission, I would like for the sake of your readers to set the record straight.

It is true that, in contrast with his table-levitations, which took place in good light, and for which no credible normal explanation has ever been proposed, his self-levitations, for whatever reason, took place in semi-darkness and so are inevitably more controversial. On the other hand, they did not occur in total darkness, as Gardner would have us believe, so that the only evidence for Home having risen would be his voice or the cross he marked on the ceiling. If that had been the case we could indeed dismiss such claims as a bad joke.

Gardner cites the authority of Robert Bell, a contemporary writer and editor whose account of a sitting with Home appeared in the *Cornhill Magazine* for August 1859. It was then edited by the well-known English novelist William Thackeray, a close friend of Robert Bell. The relevant passage in Bell's account is as follows:

> I was sitting nearly opposite to Mr. Home, and saw his hands disappear from the table, and his head vanish into the deep shadow beyond. In a moment or two more he spoke again. This time his voice was in the air above our heads. He had risen from his chair to a height of four or five feet from the ground. As he ascended higher he described his position, which at first was perpendicular, and afterwards became horizontal. He said he felt as if he had been turned in the gentlest manner, as a child is turned in the arms of a nurse. In a moment or two more, he told us that he was going to pass across the window, against the grey silvery light of which he would be visible. We watched in profound stillness, and saw his figure pass from one side of the window to the other, feet foremost lying horizontally in the air. He spoke to us and told us that he would turn the reverse way, and recross the window; which he did. His own tranquil confidence in the safety of what seemed from below a situation of the most novel peril gave confidence to everybody else; but, with the strongest nerves, it was impossible not to be conscious of a certain sensation of fear or awe.

Nor was Bell the only witness whose testimony we have. The physician Dr. James Gully (well known in his day as the pioneer of hydrotherapy and suchlike nature cures) wrote to the *Morning Star* newspaper to confirm Bell's account. There he writes: "Even when the room was comparatively darkened light streamed through

the window from a distant gas-lamp outside, between which gas-lamp and our eyes Mr. Home's form passed, so that we distinctly perceived its trunk and limbs; and most assuredly there was no balloon near him, nor any machinery attached to him."

Thus we see that it is only Martin Gardner who speaks of "pitch darkness" as prevailing during the levitations. I would suggest that the reason for the mark on the ceiling was not because the sitters could not see him during the ascent but to convince themselves afterwards that they had not been hallucinating, which even then was a favorite counterexplanation.

It is interesting to note that the readers of the *Cornhill Magazine* must have been rather like readers of the SKEPTICAL INQUIRER. They were furious with Thackeray for publishing such rubbish, and a group of scientists that included the physicist John Tyndall descended on him to remonstrate. Thackeray is reported to have told them that it was all very well for them to protest because they had never seen any spiritualist manifestations, whereas he, Thackeray, had been present with Home when a heavy dining-room table covered with decanters, glasses, and dishes had risen in the air.

Finally, we would be foolish to ignore the testimony of William Crookes. He writes (*Quarterly Journal of Science,* January 1874): "The most striking cases of levitations which I have witnessed have been with Mr. Home. On three separate occasions have I seen him raised completely from the floor of the room. Once sitting in an easy chair, once kneeling on his chair, and once standing up. On each occasion I had full opportunity of watching the occurrence as it was taking place."

I have no quarrel with Martin Gardner for expressing doubts concerning the authenticity of Daniel Home, but he can no more *know* that Home was a charlatan than I can *know* that he was not. Home no longer exists and there is no one at the present time who is remotely like him, so we can but wonder. Meanwhile, let us at least be careful to allow the evidence to speak for itself.

John Beloff
Department of Psychology
University of Edinburgh
Edinburgh, Scotland

Home's Levitations: Martin Gardner Replies

WHAT A STRANGE response! Professor Beloff totally ignores my statement that during Home's séances "the room was seldom totally dark because it was necessary to see such things as fluttering white hands."

Let me quote more fully from Robert Bell's article "Stranger than Fiction," which ran in the *Cornhill Magazine* in August 1860—not 1859, as Beloff has it.

The guests sat around a table near a window. Home's spirits had asked that the gas lights be extinguished, and the only light came from a dying fire and from the window. "We could see but scarcely distinguish our hands upon the table," Bell

writes. After the usual minor miracles, a spirit hand pulled down the blind, "and the room was thrown into deeper darkness than before." The major miracles now began. Some sitters thought they saw Home's accordian move. "I could not," writes Bell. "it was as black as pitch to me." Later he thought he saw it move.

The grand climax was Home's flotation. All Bell could see of *this* miracle was a vague shape crossing the grey light of the window.* He points out that the only way sitters could judge Home's location in the air was from his voice growing fainter when he moved farther away. Bell felt a foot touch his shoulder. At least he assumed it was a foot. But when Bell placed his hand on it, Home uttered a cry of pain and the "foot" withdrew. What a disaster if Bell had tried to explore the ankle or leg!

While Home was floating here and there, "the accordian, which we supposed to be on the ground under the window"—"supposed," because it was too dark to see it—"played a strain of pathos in the air." I dislike giving away magic secrets, but Home's accordian music was almost certainly produced by a tiny harmonica, easily concealed in the mouth and played without hands. The country singer June Carter is among many entertainers today who do this expertly. It is amusing to learn that the favorite airs the spirits played on Home's accordian were simple tunes like "Home Sweet Home" that do not require sharps and flats, only the single octave these little mouth organs have.

Just two theories can explain why the great physical mediums of the past century (where are such giants today?) performed their wonders in almost total darkness. (Absolute darkness, by the way, is not only useless for such séances but impossible to obtain except in windowless rooms.) The theories are:

A. Something in the nature of light has a negative effect on whatever psi force lifts the medium. What would have happened if some awful skeptic had managed to get past Home's careful screenings and suddenly turned on the gas light while Home said he was making his usual mark on the ceiling? Does Beloff think Home would have dropped to the floor? Otherwise, why not levitate in the light so there would be no question about it? It would be interesting to know Beloff's answer.

B. It is a thousand times easier for a fake medium to cheat when lights are off than when they are on. Indeed, it is like shooting fish in a barrel. Here is how *Punch* (August 18, 1860) reacted to the *Cornhill* article:

HOME GREAT HOME!

(Respectfully dedicated to all Admirers of that mighty Medium)

Through humbugs and fallacies though we may roam,
Be they never so artful, there's no case like HOME.
With a lift from the spirits he'll rise in the air,
(Though, as lights are put out, we can't see him there).

Spring-blinds will fly up or run down at his word
(If a wire has been previously fixed to the cord).
He can make tables dance, and bid chairs stand on end
(But, of course, it must be in the house of a friend).

*There are several ways Home could have made the shape resemble a man on his back. The simplest would be to put his boots on his hands, stretch his arms out horizontally, throw back his head, and walk slowly in front of the window, pausing a moment in mid-passage to suggest a longer distance between feet and head. Shoes on the ends of two sticks would make the illusion perfect.

Robert Bell was a journalist, a spiritualist, and a friend of Home. That a parapsychologist of Beloff's reputation can still take seriously eyewitness accounts of Home's levitations, by true believers sitting in almost total darkness, in equally total ignorance of methods used by the great charlatans of the time, is almost beyond belief. I suppose it is some sign of progress that modern psychics perform their tricks in daylight.

As for Dr. Gully, "A gull indeed!" was Robert Browning's comment. (It took only one séance for Browning to spot Home as a fraud—a "dungball" he once called him.) William Crookes is a long story. I content myself with saying there is ample evidence he was as gullible as Conan Doyle and totally unreliable in reporting what he saw in near darkness. It is astonishing how often spiritualists, describing what they "saw" in a séance, neglect to add that the room was almost pitch black.

Concerning Beloff's incredible response, I couldn't have asked for a more dramatic confirmation of my column's central theme.

Martin Gardner
Hendersonville, N.C.

Some Features of Pseudoscience

While it may be true that there can be no hard-and-fast line of demarcation between science and pseudoscience, there are certain features which characterize pseudosciences and mark them off from science. One of these is the lack of an independently testable framework of theory capable of supporting, connecting, and hence explaining their claims. Such a framework was altogether absent in Velikovsky's case. In the case of parapsychology, the basic assumption is that psychical phenomena exist, and there is no way in which this could be falsified: it is an irrefutable doctrine. Thus, the possibility that it may be true can never be denied, even if no convincing evidence has ever been produced to support this possibility. Even if we were to assume, as many do, that parapsychologists have never produced any evidence for the existence of psychical phenomena that was not fraudulently obtained or attributable to statistical anomalies or the result of self-deception, we could not say that such phenomena might not properly be detected some day. This, of course, is what gives parapsychology its peculiar strength with large sections of the general public. Many people believe that because an idea cannot be refuted, they have a warrant for thinking it true. But this is not so.

—J. W. Grove, "Rationality at Risk: Science against Pseudoscience," *Minerva* (Summer 1985)

From Our Readers

The letters column is a forum for views on matters raised in previous issues. Letters are more likely to be published if they are brief and typed double-spaced. They may be edited for space and clarity.

When mountains skip

In his review of *Ancient Astronauts, Cosmic Collisions, and Other Popular Theories About Man's Past* (Winter 1985-86), Kenneth Feder ascribes the psalmist's observation "the mountains skipped like rams, the hills like lambs" to a poetic device for glorifying the power of god, not the eyewitness account of some planetary catastrophe. I agree with his explicit statement but doubt his implicit one, that it was not a description of something observed. It is very likely a good description of what actually was seen, and here I would counter Stiebing's point; it is only with modern hindsight that it is readily understood.

As one who has watched the hills skip like lambs, and as one who has watched (and photographed) people (apparently) walk on water ("Theological Optics," *Applied Optics,* 14 [4] [1975]: A92-A93), I find myself often at pains to make the distinction between the behavior of images and the behavior of objects. They are not, after all, constrained by the same rules. We readily make the distinction when using binoculars or watching television, but often fail to consider that the atmosphere, too, can present us with images whose behavior would be considered miraculous if ascribed to objects.

My favorite description of dancing hills was given by Hudson Stuck (*Ten Thousand Miles with a Dog Sled,* Scribner, 1915, p. 90):

> As we travelled, these distant peaks began to take the most fantastic shapes. They flattened into a level table-land, and then they shot up into pinnacles and spires. Then they shrank together in the middle and spread out on top till they looked like great domed mushrooms. . . . It was fascinating to watch these whimsical vagaries of nature that went on for hours. . . . The psalmist's query came naturally to the mind, "Why hop ye hills?" and our Kobuk boy Roxy, whose enjoyment of fine landscapes and strange sights was always a pleasure to witness, answered the unspoken question. "God make mountains dance because spring come," he said prettily enough.

Archdeacon Stuck observed his hopping hills in the cold of a Yukon winter; I, in the heat of a Puget Sound summer. I have every reason to suspect that skipping rams was an appropriate simile for something the psalmist saw, albeit an image rather than an object.

Alistair B. Fraser
Professor of Meteorology
Penn. State University
University Park, Pa.

Bio-communication

Martin Ebon, in his intriguing article "Psychic Studies: The Soviet Dilemma" (Winter 1985-86), mentions that Soviet

parapsychologists have re-labeled "telepathy," in Aesopian language, "bio-communication." However, it should be noted that "bio-communication" is also used in the Socialist countries in an eminently respectable sense, as, for example, in the excellent book by the East German ethologist, G. Tembrock, in his *Biokommunikation* (Berlin, 1971). Tembrock also uses "telecommunication" (*Grundriss der Verhaltenswissenschaften,* Jena, 1980, pp. 161, 282), as the opposite of tactile communication in the animal world.

Incidentally, mention of the "psychic" Nina Kulagina really requires mention of Martin Gardner's definitive "Dermo-optical Perception: A Peek Down the Nose," now conveniently available as Chapter 6 in *Science: Good, Bad and Bogus* (Prometheus, 1981).

Thomas A. Sebeok
Indiana University
Bloomington, Ind.

Moon and Behavior

The article on the effect of lunar phases on human behavior ("The Moon Was Full and Nothing Happened," Winter 1985–86) did an excellent job in demonstrating that any gravitational effect of the moon would be negligible and in showing in a review of studies of lunar phases and psychopathology that no significant relationship has been found.

If there is any relationship between the lunar cycle and human behavior, the most likely association appears to have been overlooked in this article. The "cool" lunar light may be the force, and its effect may be on human sexuality rather than on aggression. The effect of light on animal and human activity is well recognized. Moonlight, at least in our culture, has a strong romantic association, although in practice it is generally overshadowed by urban lights. The equal length of the lunar month and the average menstrual cycle (29.5 days) would appear to be more than a coincidence.

A computer search on the relationship between the lunar phase and the menstrual cycle yielded ten references. These confirmed the equality of lunar and average menstrual cycle.[1,2] The average period between conception and birth is nine lunar months.[3] Nocturnal photic stimulation during the human menstrual cycle days 14–17 has been found to reduce the variance of cycle length.[3] Weak but statistically significant relationships have been found between lunar phase and probability of menstruation and childbirth.[1,2]

I suspect that some of these findings would be insufficient to meet the test of a skeptical meta-analysis, but they do suggest that further study would not be inappropriate. The weak association between the lunar and menstrual cycle would be expected in our society, where moonlight is overwhelmed by artificial light. More substantial results might be obtained by studying a more primative, outdoor society.

It would appear then that moonlight may have had a substantial effect on our biological heritage but is having a minimal effect on our present-day behavior. If we understand them correctly, we may find in myths some fossils of history.

David W. Briggs
Psychologist
Augusta, Me.

1. W. B. Cutler, Lunar and Menstrual Phase Locking, *Am. J. Obstet. Gynecol.,* 137(7): 834–839.

2. W. and A. Menaker, Lunar Periodicity in Human Reproduction: A Likely Unit of Biological Time, *Am. J. Obstet. Gynecol.,* 77(4): 905–913.

3. E. M. Dewan, Phase Locking of the Human Menstrual Cycle by Periodic Stimulation, *Biophys. J.,* 9:A207, 1969.

Kelly et al. miss one major cognitive bias for belief in lunar effects, that is, that until we got decent lighting an apparent lunar effect did exist.

In the old days, nights without a full moon had to be spent quietly at home, which is where all "sane" people were even when the moon was full. Those with crazy ideas about having some fun at night could largely only act when the moon provided enough light. Thus the

observer would see a great increase in "crazy" behavior during full moons. Whether we then say the moon caused crazy behavior depends on just what definitions we use, but the relationship itself existed until electric lighting became common. As that date becomes more ancient, we expect the belief in lunar effects to fade.

David Carl Argall
La Puente, Calif.

Fringe medicine

I enjoyed and sympathized with Karl Sabbagh's analysis of fringe medicine, "The Psychopathology of Fringe Medicine" (Winter 1985-86), with the exception of the very last sentence, in which Mr. Sabbagh disapproves of the "freedom to offer unproven and unscientific remedies to the general public."

This is, needless to say, a commonly held sentiment; nonetheless, I would like to register my disagreement. I believe that the suppression of beliefs—yes, even the demonstrably irrational beliefs in some fringe medicines—is censorship. Nor do I support the outlawing of remedies based on such beliefs.

Why should we "allow" people to embrace and/or propagate irrational beliefs and the destructive behavior that flows from such beliefs? Because, even though this may result in a far from "perfect" society, there is no better alternative. To put the question as simply as possible: Which is preferable, that each *individual* should have ultimate control over his or her medication or that the *state* should have such control?

Robert F. Tinney
Baton Rouge, La.

Karl Sabbagh's article raises important questions. I think his answers, however, are too slanted against taking seriously any values in "fringe medicine" per se. For instance, one of his important summary points is that "illness is cured *either* by foot manipulation *or* by belief in foot manipulation . . . but not by both." The fallacy in this too-simple set of options is easily perceived in this paraphrase: "Illness is cured *either* by effective medicine *or* by belief that the medicine will be effective, but not by both." Actually, of course, "both" are more likely than the "either-or" setup of Mr. Sabbagh.

Lindsey Pherigo
St. Paul's School of Theology
Kansas City, Mo.

Bravo! Karl Sabbagh's article was superb—humorous, acerbic, and to the point. Freireich's "Experimental Plan" and the "ratchet effect" are delights. I'll have to trade in my digital watch for a wind-up model so I'll have something to demonstrate effectively with.

On another subject. I was a trifle disturbed at the responses to my earlier letter as it relates to religion. Due, no doubt, to length you had to edit out my statement, "I'm not advocating here that you alter the basic editorial content of the SKEPTICAL INQUIRER to include numerous attacks on religion . . ." and my examples of the fine line between "religion" and "pseudoscience." As a result, the responses were primarily aimed at keeping *SI* from engaging in direct confrontations with religion. It was not my intention to suggest *SI* do this. I am a regular reader of both *Free Inquiry* and *The Humanist,* both of which treat the subject of religion quite exhaustively; the SKEPTICAL INQUIRER clearly has another mission. My problem with *SI*'s position on religion is more a philosophical one.

What is the fundamental difference between a person who believes that he or she talks to god, angels, or the dead, and who believes in biblical miracles like walking on water, and a person who believes in telepathy, clairvoyance, astrology, and telekinesis? I can see no real distinction. Both persons' beliefs, it seems to me, are essentially based on faith. One shrouds faith in "religion" the other in what we call "pseudoscience." Both may base substantial aspects of their behavior

on their beliefs. Both abjure reason.

Dave Gerr
Throgs Neck, N.Y.

Computers and rational thought

I have to disagree with some of the opinions expressed in Spangenburg and Moser's article "Computers and Rational Thought" (Winter 1985-86). The authors advanced the argument that the long-range social impacts of widespread computer use may be to restrict people to a yes-no, "linear," rather than "gestalt" type of thinking.

First, the authors suggest that the speed and efficiency of computers (in word-processing, particularly) may adversely affect the writer's "coherence, clarity, and reflective deliberation." Of course this is nonsense. I have no doubt that peeved authors, brought up in a quill-pen and foolscap era, uttered the same complaints at the time of the invention of the typewriter.

Like an electric typewriter, or pen and paper, or, for that matter, a brick of wet clay and a sharp stick, a word-processor is only a tool. The difficulty in using a tool is a poor measure of the worth of the result. Writing with a word-processor no more guarantees a poor product than laboriously using a piece of bark and a charcoal stick guarantees a literary masterpiece. I would say instead that, by simplifying the mechanical task of composition, the word-processor allows the author to fine-tune and clarify his ideas.

Spangenburg and Moser next decry the limitations of linear or "framework" thinking. They point out, quite correctly, that "breakthrough" concepts are most often arrived at by nonlinear, intuitive thinking. There is no doubt that there are limitations to binary-logic thought-patterns. The authors fail, however, to prove their opinion that use of a computer will somehow promote this type of cogitation.

Their argument is equivalent to saying that the widespread use of refrigerators will cause people to have little lights that go on when they open their mouths. A user of a tool does not acquire that tool's characteristics. Using toothpicks does not make you wooden, using a knife doesn't make you sharp, and using a computer will not (unfortunately) make you logical.

The authors again are correct when they state that uncomprehending acceptance of technology by the public is a danger. Since most people do not understand the physical processes behind the devices they use every day, they cannot distinguish between what is possible and what is impossible. To a person without any knowledge of physics, telepathy probably seems as plausible as radio.

But this is not a problem caused by computers. It is caused by an inadequate, incomplete, and wrongly directed education. The only thing that can solve it is better education. More people must be taught to think rationally, to be skeptical toward the prevailing culture-myths, and to understand scientific methodology. With their capacity for greater individual instruction, it may well be that computers are part of the solution to this problem.

Steven J. Johnson
Los Alamitos, Calif.

I suppose for someone sitting on the periphery of data processing, psychology, and/or socio-anthropology it may be simple to extract a few contextual remarks by others on the same periphery and write about how computers may be adding to mysticism.

The realities are quite opposite from the supposed support of mysticism by computers and computer systems. Equating the functions of a computer with simple on/off, true/false decisions is a tremendous oversimplification, which in fact is a reductio ad absurdum. . . .

An attempt to discredit computers is often done by making a connection between computer logic and a crippling of higher thought processes because the computer gives answers without the user knowing the process the computer uses. I may get a required result without knowing the mechanism, but I am absolutely sure that there is a physical process sup-

ported by a scope-limited program that allows only those responses programmed and supported by the hardware in use to be output by me. The acceptance of the process is not analogous to faith and mysticism, because I can repeatedly test the program and get duplicatable results, which is a criterion of the scientific method. . . .

In actuality, the use of computers in schools has an interesting effect on students. Even though the technology will probably be obsolete by the time they graduate, the students have been learning the realities of a cause-and-effect world. No amount of sweet smiles, polemics, or being teacher's pet will make a computer accept a wrong answer. There is simply a straight cause-and-effect relationship. The level of complexity and cogitation required for more abstract or complex thinking should and is left to means other than the computer. . . .

John Bohatila
Canyon Country, Calif.

The Spangenburg/Moser article pointed out the changes in our thinking brought about by the wide use of, and dependence upon, computers. Their observations were very important to a better understanding of problems faced by investigators of paranormal claims.

There is another impact on paranormal research—also a result of the Computer Revolution—that was not mentioned by these authors. Any reasonably well funded and intelligently designed parapsychology experiment cannot fail to make use of a computer program to some degree. A search for elusive and often marginal results calls for extensive application of computer technology to allow the experiment to be performed more quickly, accurately, and efficiently, while extending the obtainable data-base by several magnitudes, in many cases.

However, as a layman with a rudimentary knowledge of such matters and a basically suspicious nature, I regard with a highly jaundiced eye any experiment that does not allow me to see within the computer program. It is obvious that a proficient programmer is quite capable of building into a program a bias that would guarantee statistically positive results. Indeed, were I designing a method for cheating in such an experiment, I would have available two almost-identical programs that differed only enough to produce my desired results in one case and chance results in the other. Both programs would display on the screen in exactly the same way, and the differences would be revealed only by complete "listings" or print-outs of the entire program.

The sleight of hand needed would consist of exchanging one disk for another and little more. It is not a difficult sleight to learn.

Bear in mind that very few researchers have available the means to attempt replication of results claimed to have been obtained in such an experiment. And, as we have often found, any failure to replicate can always be attributed to experimenter attitude, a familiar plea in these cases that most observers find unacceptable.

This additional problem with computer dependency, beyond that which Spangenburg and Moser have so well delineated, is that the addition of the computer technology may obfuscate the basic experimental procedure by blinding the observer with yet more equipment. Simplicity has its charm—and clarity. I will postulate here "Randi's Razor," though that is an instrument with which I have only the most fleeting acquaintance: "Do not multiply unnecessarily the number of loopholes or the amount of machinery."

James Randi
Sunrise, Fla.

Legends are fun

I am a new subscriber, and agree with your apparent premise that there is still a lot of superstitious hogwash in the world and that it may be better to inquire skeptically about the truth of things.

However, the review by anthropologist Kenneth Feder of *Ancient Astro-*

nauts, Cosmic Collisions, and Other Popular Theories About Man's Past prompts me to speculate that there may be good reason for what we view as the unscientific views of the majority of our fellow humans.

Here is my short-cut explanation of why most people may not reason the SKEPTICAL INQUIRER way:

Occam's Razor (or, in laymen's language, the simplest explanation is the most likely): For many, it is simpler to accept biblical or derivative explanations of the cosmos than to accept what the scientific community considers to be the merest beginning to unraveling Truth: evolution, dimensions beyond 3, the Big Bang, the paradox that time and energy/matter are finite but had no beginning. Which is easier to believe, ancient astronauts or the idea that the universe was once the size of a basketball? You might say it is harder to sustain the Bible and Velikovsky when you get into the logic behind them, but most people have neither the time nor the inclination nor the ability to do so.

The Cry-Wolf Syndrome: Many outside the scientific community are aware that yesterday's heresy is today's orthodoxy. Examples:

—Coelacanths.

—Einstein's theories.

—Evolution: once rejected, later accepted, now perhaps about to be drastically modified because of the accumulating evidence that dinosaurs were wiped out by the effects of Earth colliding with an asteroid.

—The tectonic plate "theory": as welcome in academia a generation ago as Velikovsky's works.

—New England cougars: Biologists have been nearly unanimous in declaring that the last wild cougar (mountain lion) was shot in Vermont about a century ago. I agreed that gullibility was a more likely explanation of the frequent claimed sightings, until four of us sober adults saw one 10 meters away by the roadside in daylight two years ago. Much of backwoods New England is as it was long ago, and there is no reason the presence of this elusive creature should be impossible.

That brings me back to the Aztecs in the book that Mr. Feder reviewed. Why is it stupid to believe that there could have been ancient communication between the New World and the Old? The long voyages of the Polynesians, the Phoenicians, and the Vikings are accepted. It's a much easier journey to the Americas via a small boat from the east (I have done it myself, alone) than from the west via the Bering Strait. I have seen an Olmec sculptured bust with Negroid hair, nose, lips, and color, which Occam's Razor might attribute to a wayward African mariner.

Let's go further: Is Truth or Happiness more important? It may be only a remarkable coincidence that Cortez landed in Mexico just when the Aztecs had long predicted that a bearded man with light skin would arrive from the east, but it would be a better story if we really knew that an Old World teacher of the Mesoamericans had told them centuries before that it would happen. Legends are fun.

Richard Dreselly
Augusta, Me.

Beliefs scale

I was amused by the overreaction of Paul Alan Berent (Spring 1985, p. 301) to the wording of an item on the Beliefs-in-the-Paranormal Scale used in the study I reported on in my note "Evidence for the Effectiveness of a Reading Program in Changing Beliefs in the Paranormal" (Fall 1984, pp. 67-70). In his *SI* letter, he said that I had "badly blundered," and in a letter he wrote to the dean of my college he said that I had "displayed incompetence." He also demanded to know what she would do to "prevent and correct this type of incompetence."

The item from the Scale causing all the furor stated, "ESP is an unusual gift that many persons have and should not be confused with the elaborate tricks used by entertainers." Had Mr. Berent read my article more carefully he would have seen that the Scale was devised by J. J. Tobacyk and not by me. I merely fol-

lowed the commonly accepted practice of buiding on the work of others and used a scale that had been researched and previously reported on in *SI* (Fall 1983, pp. 57-61).

I am not trying to use this point as an excuse. The item certainly could have been improved upon, but I don't agree with Mr. Berent's contention that the phrase "*unusual* gift that *many* persons have" is contradictory at all. According to *Webster's Unabridged,* "unusual" means "uncommon or rare" and by this can mean "belonging to a small or *relatively small* [italics added] group or class." "Many" means "consisting of a great number; numerous; not few." My understanding of these meanings is that it is quite reasonable to claim that "a relatively small group can, nevertheless, consist of a great number of people." If, for example, we define very high intelligence as being above the 99th percentile on a given test, can we not agree that it is "unusual" while at the same time admitting that more than two million people in the United States alone can be considered as "many" people?

Even if he were correct and it was a contradictory item, is it not even *more* distressing that such a small percentage of my respondents (20.6 percent) initially disagreed with it?

Paul J. Woods
Professor of Psychology
Hollins College
Hollins, Va.

A lesson from Velikovsky

Martin Gardner's review of Henry Bauer's *Beyond Velikovsky* (*SI,* Summer 1985) shows that lessons for combating pseudoscience still remain to be learned from the Velikovsky controversy. In retrospect, Velikovsky is a pathological case insofar as scientists (and other experts) easily perceived how wrong Velikovsky was, but were ineffective in setting forth a valid refutation that was convincing to informed readers. Bauer shows that much of the early criticism, when not dogmatic rejection, was fallacious, erroneous, or irrelevant. Even Carl Sagan conceded as much in *Scientists Confront Velikovsky;* yet his analysis of *Worlds in Collision* was also seriously flawed as *Kronos* showed in *Velikovsky and Establishment Science.* Correcting the mistakes of critics diverted attention from examining Velikovsky's ideas.

In concentrating their efforts on *Worlds in Collision,* critics ignored Velikovsky's other books, especially *Earth in Upheaval,* and a host of quite impressive articles written by technically qualified people, e.g., Robert Bass (professor of physics and astronomy). Many well-educated sympathizers understood that Velikovsky was wrong on certain issues; but, in the belief that there was some underlying truth to Velikovsky's scenario, they took consolation from the ignored and unrefuted articles supporting him.

To be effective in public controversies, scientific critics must deal skillfully with the issues as they are perceived by the public. Failure to do so diminishes the credibility of the critics, gives consolation to supporters, and prolongs the controversy among informed observers. As long as critics "disproved" Velikovsky while ignoring supporters like Bass, the controversy looked to many as a dispute between opposing "experts."

As it turns out, the impressive technical articles supporting Velikovsky are as lacking in substance as Velikovsky's use of sources that Bob Forrest has convincingly discredited, as in *SI,* Winter 1983-84. Thus the "wild motions" invoked by Bass in 1974 to explain Velikovsky's orbit shuffling do not apply to planets in our solar system, and his arguments that disrupted orbits can settle down quickly are actually groundless.

The less one knows about science, the more plausible Velikovsky's scenario appears, especially when most of the discussion is hand-waving. Conversely, the more knowledgeable the reader, the easier it is to see that Velikovsky's entire physical scenario is untenable. But unless a critic explains *why* something is wrong, the rejection is more *ex cathedra* than a credible refutation.

For years Velikovsky and his supporters, e.g., Lynn Rose in *Velikovsky*

Reconsidered, claimed that at close distances electromagnetic forces could rival, if not dominate, gravity. Critics simply denied this. Velikovsky's intuition on this point, however, is not borne out, not even in his oft-repeated example of a 7,000-gauss magnetic binary star. Using generous assumptions, James Warwick recently showed that gravity overwhelms magnetism by a factor of over a billion. All this and more are explained in my articles in *Kronos,* 10(1), 10(3), and 11(1).

In a review of Bauer's book in *Nature* (April 25, 1985), Owen Gingerich observed, "Although science cannot prove a Velikovskian scenario is impossible, it might well prove that it did not happen." This is a point Bauer is reluctant to concede because so many "disproofs" have been either indeterminant or wrong. However, the Terminal Cretaceous Event 65 million years ago, whatever it was, left unambiguous worldwide signatures of iridium and soot. The catastrophes Velikovsky conjectured within the past 3,500 years left no similar signatures according to Greenland ice cores, bristlecone pine rings, Swedish clay varves, and ocean sediments. All provide accurately datable sequences covering the relevant period and preserve no signs of having experienced a Velikovskian catastrophe. Although Velikovsky believed *Earth in Upheaval* proved his scenario happened, his evidence can be explained without invoking cosmic catastrophes.

While for the "true believers" no observational evidence is sufficient to prove the contrary, the open-minded are susceptible to reason and are the best target for efforts like CSICOP's. When R.G.A. Dolby first proposed the Greenland ice-cores as an empirical test of Velikovsky's ideas in 1977, he wrote me that he "did not really expect it to settle the matter one way or the other, but thought that the way it was handled by Velikovsky supporters might be revealing about the scientific content of their position." Indeed, one supporter with a Ph.D. in physics told me, "I know of nothing that can be called a 'crucial' test of V's concept," while another supporter wrote, "That the ice core data does *not* contain strong acidity 'peaks' in or near years of Velikovsky singularities is sufficient *dis*proof for me, even for the general scenario."

While interest in Velikovsky has waned, he continues to be discussed, as in *Science and Unreason* (1982) by Daisie and Michael Radner and by J. W. Grove in *Minerva,* 23:2 (1985). Although Bauer's book was completed before Velikovsky died in 1979, it is, with later additions, the most complete account of the Velikovsky controversy so far. However, many key incidents are missing because they are not on the public record. Velikovsky excluded much from his memoir *Stargazers and Gravediggers* that did not suit the public image he cultivated. We can only speculate what the situation would be today had Velikovsky's unreasonable terms not squelched a project with the Wolper Organization in late 1974 for a television special on *Worlds in Collision.*

The foregoing is available in a longer, fully documented version including a list supplementing Bauer's references. It may be obtained by sending a self-addressed, stamped envelope to the writer at 3929A Utah Street, St. Louis, MO 63116.

C. Leroy Ellenberger
St. Louis, Mo.

Electronic inquisitor

Suddenly, the lie-detector is back in the news.

Many years ago, we—the poor, gullible, easily hoodwinked skeptics that we then were—had decided, in all innocence, that the lie-detector had been thoroughly debunked, together with such kindred machinery as the dowsing-rod and the doodlebug; but, no—here we go again. The leader of the free world now proudly and unblushingly tells us that, under a new name (polygraph), the lie-detector has been casually and widely used by federal agencies for a long time and has duly elicited confessions galore. Poor Schultz! He probably counted himself, in his younger days, among those starry-eyed skeptics of old.

But what is to be done now? Must

we acquiesce in the official (i.e., presidential) stance that the lie-detector is a "useful tool," past debunkings notwithstanding? It certainly looks like it. For who would be foolhardy enough to question the claims of a federal Intelligence?

Very well; but, as we quietly decide to become silent skeptics in this matter, let us recall what Spangenburg and Moser wrote recently (Winter 1985–86) concerning another gadget in our lives, the computer: "So it is time to rethink this wonder machine's place in our thought processes—making sure that in capitalizing on its benefits we do not abdicate our own responsibilities. As skeptics not only of the irrational and the illogical but of all that is presented to us as unquestionable fact, the responsibility is ours."

A. P. Grishin
Cary, N.C.

Psychics and TV

After viewing a local evening television show that included an end-of-the-year report on the dismal record of psychics' predictions, I wrote the enclosed letter to the station. I think it's important not only to protest poor reporting of the paranormal but also to give vigorous encouragement to good treatment of the subject.

To KPIX-TV, Channel 5:

Congratulations for airing the "Evening Magazine" segment tonight on the success rate of predictions by psychics for the year 1985! Television is so filled with unfactual hype about psychic claims that it is refreshing to see a report on their actual record. Why not have such segments more often than just one day a year?

Paul V. Turner
San Francisco, Calif.

A nonpsychic prediction

It seems to me that, if psychics have any real precognitive abilities, their average rate of accidental death or injury should be low. Perhaps some actuarially inclined reader would consider tracking a group of proclaimed psychics to see if they compare favorably with comparable groups.

I would like to "predict" that no difference would be found and that the "explanations" offered will include these: that personal information is withheld from psychics, that everyone is equally psychic in this regard, and that the outcome cannot be changed, even with foreknowledge. Each of these raises interesting questions and will perhaps lead to further discussions.

Mark Beutnagel
Philadelphia, Pa.

Religion and investigation

I am a subscriber to *SI* because of the good work of CSICOP and because of its stated principles of investigation. CSICOP is to be especially praised for its statement that it "does not reject claims on a priori grounds, antecedent to inquiry, but rather examines them objectively and carefully."

I am both an ordinary, orthodox physicist and an ordinary, orthodox Christian. When I was a professor in a Christian college I used material from such authors as Klass and Randi because I wanted my students to learn to think clearly and rationally.

It is good that *SI* prints letters and responses on the subject of religion. When any religion makes falsifiable claims, those claims ought to be subject to the same cool scrutiny as any tale of ancient astronauts.

Since I first started reading *SI*, however, no one seems to have pointed out that the traditional basis of Christian faith is falsifiable. That is, the foundation of orthodox Christianity is an acceptance of a number of allegedly historical reports of supernatural events that occurred in Palestine in Roman times. The most notable such report is that a man was executed, buried, and became alive in the flesh on the third day. If this particular historical claim were shown to be incredi-

ble, then orthodox Christianity would be simply wrong.

I will respect the conclusion of anyone who decides that the historical claims of orthodox Christianity have indeed been falsified. But I wish Russell Straw (*SI*, Winter 1985-86) would not make such sweeping statements as "Science is based on fact; religion, on faith." It may be as Jeffrey Governale (*SI*, Winter 1985-86) says, that " 'God' cannot be debunked through the use of scientific method." But the traditional Christian records make claims about historical events that are, at least in principle, vulnerable to rational investigation.

John F. Davis
Los Alamos, N.M.

D & D and statistics

Recently, both *Newsweek* and CBS's "60 Minutes" devoted space to examining a purported line between the popular game "Dungeons and Dragons" and teenage suicide. In both cases the coverage was blunt and brutal, and smacked of sensationalism.

The television coverage stated two facts very strongly: one, that there were as many as three million young people playing Dungeons and Dragons (the game has sold eight million copies); and two, that the known instances of 28 cases in which the game and a youthful suicide are linked is positive statistical evidence for a causal relation.

Yet, according to the 1985 *World Almanac and Book of Facts* (Newspaper Enterprise Association, Inc.), suicides in the age group of 12 to 24 are at approximately 12 per 100,000 individuals—which would suggest that, all other factors being ignored, the "expected" number of Dungeons and Dragons players in that age group who commit suicide should be roughly 360.

At this point, I think we have another instance of the well-known "mashed potato" coincidence: 95% of convicted felons are said to enjoy eating mashed potatoes.

Jefferson P. Swycaffer
San Diego, Calif.

Author's correction

This note is to call attention to an error in our paper "The Moon Was Full and Nothing Happened" (Winter 1985-86). The expression on page 134 for the tidal force should read as follows:

$$F_{TIDE} = \frac{GRMm}{d^3}$$

where m is the mass of the object upon which the tidal force is exerted. This omission, however, does not alter the basic outcome or conclusions regarding the relative magnitudes of the tidal forces, since the m's cancel out in computing the ratio F_1/F_2. We regret any confusion this error may have caused your readers.

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Local Organizations

(groups with aims similar to CSICOP's)

Arizona

Tucson Skeptical Society (TUSKS), Ken Morse and James McGaha, Co-chairmen, 2509 N. Campbell Ave., Suite #16, Tucson, AZ 85719.

California

Bay Area Skeptics, Robert Sheaffer, Chairman, P.O. Box 2384, Martinez, CA 94553.

Sacramento Skeptics Society, Terry Sandbek, 4095 Bridge St., Fair Oaks, CA 95628.

San Diego Skeptics, R. W. (Ernie) Ernissee and Elié Shneour, Co-chairs, Box 17566, San Diego, CA 92117.

Southern California Skeptics, Al Hibbs, Chairperson, Al Seckel, Executive Director, P.O. Box 7000-39, Redondo Beach, CA 90277.

Colorado

Colorado Organization for a Rational Alternative to Pseudoscience (CO-RAP), Béla Scheiber, Director, P.O. Box 7277, Boulder, CO 80306.

Illinois

Illinois Skeptics, Sandy Smolinsky, 5740 N. Sheridan, 11E, Chicago, IL 60660; Andrew Skolnick, Univ. of Illinois at Urbana, Davenport House, 807 S. Wright, Urbana, IL 61820.

Minnesota

Minnesota Skeptics, Robert W. McCoy, 549 Turnpike Rd., Golden Valley, MN 55416.

New York

New York Committee for Skeptical Inquiry (NYCSI), Terence Hines, 51 Westchester Ave., Thornwood, NY 10594.

Western New York Skeptics, Paula Jung, Box 444, Holland, NY 14080.

Ohio

South Shore Skeptics, Page Stephens, 1346 W. 64th St., Cleveland, OH 44102

Oregon-Idaho

Northwest Skeptics, John Merrell, Oregon-Idaho Coordinator, P.O. Box 5027, Beaverton, OR 97007.

Pennsylvania

Paranormal Investigating Committee of Pittsburgh (PICP), Richard Busch, Chairman, 5841 Morrowfield Ave., #302, Pittsburgh, PA 15217.

Texas

Austin Society to Oppose Pseudoscience (A-STOP), Lawrence Cranberg, President, P.O. Box 3446, Austin, TX 78764.

Dallas Society to Oppose Pseudoscience (D-STOP), James P. Smith, Science Div. of Brookhaven College, Dallas, TX 75234.

Houston Society to Oppose Pseudoscience (H-STOP), Steven D. Schafersman, Chairman, P.O. Box 541314, Houston, TX 77254.

Washington

Northwest Skeptics, Michael R. Dennett, Chairman, Washington Coordinator, 4927 SW 324th Place, Federal Way, WA 98023.

West Virginia

Committee for Research, Education, and Science Over Nonsense (REASON), Steven Cody, Chairperson, Dept. of Psychology, Marshall University, Huntington, WV 25701.

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